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CONTENTS FOR MAY, 1920.

Continued on Page 3.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT-WOOD'S OFFICES, 11, RED LION SQUARE, LONDON, W.C.1, WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED. TELEPHONE HOLBORN 6191.

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CONTENTS—continued from page 1.

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The Royal United Service Institution,

WHITEHALL, S.W.1.

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the sum of £ _____ (free of duty),

or (in case of a specific legacy) my _____ (free of duty),

to be applicable for the general purposes of such Institution.

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*During the War the entrance fee of £1 1s. has been suspended and the Life Subscription reduced to £10. and the Library Subscription to 5/- per annum.

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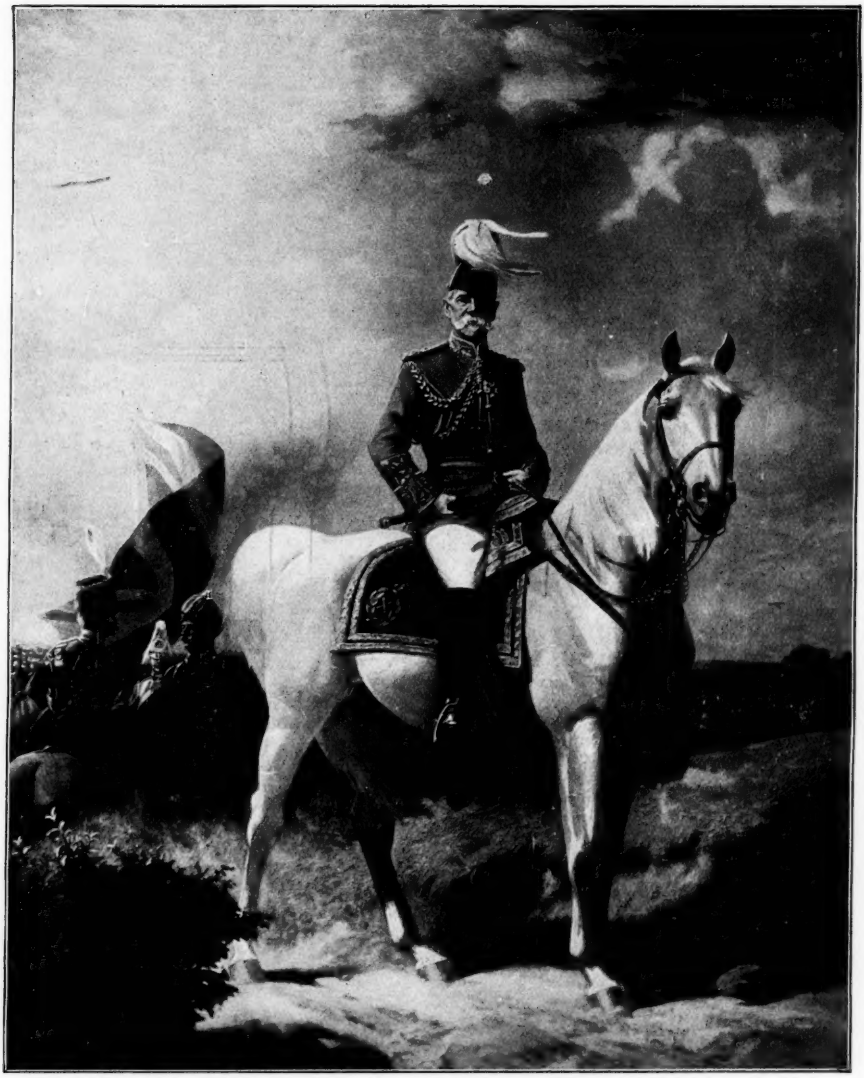

THE LATE FIELD-MARSHAL EARL ROBERTS, V.C., K.G., K.P., G.C.B., O.M., G.C.S.I., G.C.I.E., Vice-President of the Institution.

By Captain Adrian Jones, M.V.O.

From the picture recently purchased by the Council, Royal United Service Institution.

SECRETARY'S NOTES.

I.—Vice-Patron.

Colonel H.R.H. The Prince of Wales, K.G., G.C.M.G., G.B.E., M.C., has graciously accepted the office of Vice-Patron of the Institution.

II.—Vice-President.

Field-Marshal Earl Haig, K.T., G.C.B., O.M., G.C.V.O., K.C.I.E., has been appointed a Vice-President, vice the late Field-Marshal Sir H. E. Wood, V.C., G.C.B.

III.—Council.

The following officers were duly elected Members of the Council at the Anniversary Meeting, viz. :—

Admiral Sir F. C. D. Sturdee, Bart., K.C.B., K.C.M.G., C.V.O.
Field-Marshal Sir H. H. Wilson, Bart., G.C.B., D.S.O.
Lieut.-General Sir Ivor Maxse, K.C.B., C.V.O., D.S.O.
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Colonel C. H. Colvin, C.B., D.S.O.
Colonel B. C. Green, C.M.G., T.D.
Lieut.-Colonel R. Shoolbred, C.M.G., T.D.

IV.—Chairman of the Council.

Field-Marshal Earl Haig, K.T., G.C.B., O.M., G.C.V.O., K.C.I.E., has been appointed Chairman for 1920-1921.

Admiral-of-the-Fleet Earl Beatty, G.C.B., O.M., G.C.V.O., D.S.O., has been appointed Vice-Chairman for 1920-1921.

V.—Honorary Members of the Council.

The following officers of the Overseas Dominions have been elected Honorary Members of the Council, viz. :—

General Sir A. W. Currie, G.C.M.G., K.C.B. (Canada).
Lieut.-General Sir J. Monash, K.C.B., V.D. (Australia).
Major-General Sir A. H. Russell, K.C.B., K.C.M.G. (New Zealand).
Lieut.-General H.H. Maharaja Bahadur Sir Pratap Singh of Jodhpur, G.C.B., G.C.S.I., G.C.V.O. (India).
General The Right Hon. J. C. Smuts, P.C., C.H. (South African Forces).

VI.—The Wolseley Memorial Room.

The collection of Historical Relics and Mementoes collected by the late Field-Marshal Viscount Wolseley, together with his medals, decorations, presentation plate and swords, uniforms, personal gifts, bust and small statuary, and other articles, which were presented by the late Dowager Viscountess Wolseley to the Institution in 1915, have now been arranged and catalogued and are on exhibition in the room at the north end of the Banqueting Hall, which has been specially decorated for the purpose. Owing to the great intrinsic value of this collection the room is kept locked, but members and visitors can be shown the room on application to the attendant in the Banqueting Hall.

A special illustrated catalogue of the collection has been printed and is on sale, price one shilling.

VII.—Officers Joined.

The following officers joined the Institution during the months of February, March and April, viz. :—

Colonel T. Bruce, C.M.G., D.S.O., R.F.A.
Captain R. Letters, M.C., Cameron Highlanders.
Captain J. D. Shapland, M.C., R.G.A.
Lieutenant R. B. Johnson, M.C., 4th Hussars.
Captain E. W. Goodman, M.C., R.G.A.
Major C. R. U. Savile, D.S.O., O.B.E., Royal Fusiliers.
Lieutenant H. L. Durell, 6th Bn. Essex Regiment (T.F.).
Lieutenant F. E. Pattisson, 5th Bn. London Regiment (T.F.).
Captain M. C. Dempsey, M.C., Royal Berkshire Regiment.
Lieutenant W. H. Knox, R.E.
Captain R. O. Chamier, I.A.
Major D. Stewart, D.S.O., R.F.A.
Lieut.-Colonel A. G. B. Lang, late I.A.
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Captain J. G. Burnet, 4th Bn. K.O. Shropshire Light Infantry (T.F.).
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Lieutenant N. J. G. Clark, Devonshire Regiment.
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Captain J. M. Hunt, I.A.
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Lieutenant R. G. Fussell, Royal Air Force.
Major H. Weisberg, D.S.O., T.D., City of London Yeomanry.
Captain F. C. Simpson, I.A.
Captain F. F. Loyd, Sherwood Foresters.
Colonel H. E. T. Kelly, C.B., C.M.G., R.A.
Commander R. W. Oldham, O.B.E., R.N.
Captain A. A. Williamson, I.A.
Captain T. A. Lennox-Bigger, I.A.
Captain H. K. Kitson, R.N.
H. J. Green, Esq., Civil Staff, War Office.
Captain T. F. Pearse, I.A.
Captain T. A. Francis, Royal Irish Regiment.

The Reverend O. E. Owen, M.A., late Lieut. R.M.A.
Major R. N. O'Connor, D.S.O., M.C., Scottish Rifles.
Wing Commander R. E. M. Russell, C.B.E., D.S.O., Royal Air Force.
Major F. Etheridge, D.S.O., I.A.
Lieutenant F. H. P. Maurice, R.N.
Major R. H. Studdert, D.S.O., M.C., R.F.A.
Lieutenant J. P. L. Eustace, I.A.
Captain W. E. Britten, O.B.E., R.E.
Brigadier-General J. A. Barlow, late Manchester Regiment.
Major R. G. Cherry, M.C., R.F.A.
Captain L. M. E. Dent, Oxfordshire and Buckinghamshire Light Infantry.
Second-Lieutenant S. G. R. Barratt, 1st Reserve Regiment of Cavalry.
Captain A. G. Adams, I.A.
Major C. J. E. Auchinleck, D.S.O., O.B.E., I.A.
Major H. M. Heyder, M.C., Northumberland Fusiliers.
Commander T. H. Binney, D.S.O., R.N.
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Cadet A. D. Kleinwort, R.N.

VIII.—Imperial Service College.

The attention of members is called to the above-named valuable Institution, which provides a sound and efficient education on modern lines and at a moderate cost for the sons of Naval and Military Officers, and special efforts are now being made to extend the College buildings. Full particulars can be obtained from the Assistant Secretary, 36, Duke Street, St. James's, S.W.

IX.—Museum Catalogue.

The Seventh Edition of the Museum Catalogue has been completed, and is now on sale, price 2s. 6d.

X.—The Museum.

The amount taken for admission to the Museum for the past quarter was :—

February, £61 4 6.
March, £78 19 6.
April, £162 10 0.

ADDITIONS.

(7100). Model of the Screw Steamer "Great Britain," built at Bristol in 1843. Length of keel 289 feet, between the perpendiculars 296 feet, over all 322 feet; breadth (extreme) 51 feet; she measured 2,984 tons and had two engines of 1,000 horse power; and when laden drew 16 feet of water. After she was completed it was found that she drew too much water to get out of the dock, which had to be deepened.—Given by H.M. King Edward VII.

(7101). Telescope which belonged to Major-General Sir Henry Havelock, who died at Lucknow on November 24th, 1857, one month after its historic relief by him. It was brought from India by Captain F. W. Graham, 3rd Oude Cavalry.—Given by M. G. A. Graham, Esq.

(7102). Sheet of Postage Stamps of the Lithuanian Republic, 1918. After the Armistice, this State being so short of paper, the first issue of

stamps were printed on the back of German Staff War Maps; some 800 of these sheets were issued, of which this is one: it shows three small errors of printing on the stamps.—Given by Major L. J. Austin, R.A.M.C.

(7103). Three Muskets, one percussion and two flint locks, of French manu-
(7104). facture. They were captured at Gunfur, Gambia River Colony,
(7105). West Africa, during the joint Naval and Military Expedition, under Rear-Admiral F. Bedford, in March, 1894, against a slave raiding chief of the name of Fodi Silah. The force consisted of detachments of the Royal Navy and Royal Marines, the 1st West India Regiment, in conjunction with H.M.S. "Raleigh," "Prœbe," "Blanche," and "Alecto," which bombarded the town from the sea.—Given by Lieut.-Colonel P. T. Westmorland, C.M.G., D.S.O.

(7106). Five Raised Plans in Plaster Casts, of Vimy Ridge, which were used by the Staff for the attack on that position, in April, 1916. They were made by Corporals W. G. Sanders and J. L. Marshall, of the 25th Company, Royal Engineers. Scale: the large plan, 3″ to a mile; smaller plan, 12″ to a mile.—Given by Field-Marshal Sir H. H. Wilson, Bart., G.C.B., D.S.O.

(7107). Officer's Full-Dress Coatee, with epaulettes, pouch, sabretasche with belt and slings, crimson silk sash, of the 1st Life Guards of the period of 1821.

Officer's Cocked Hat, 1st Life Guards, of the period previous to the Union (1802).

(7108). Officer's Full-Dress Coatee, with shoulder knots and aiguilettes, 4th Dragoon Guards, 1820.

(7109). Officer's Full-Dress Coatee, with epaulettes and Shako of the Hon. Artillery Company, of the period of 1840.

(7110). Soldier's Coatee, of the Coldstream Guards, King William IV. period.

(7111). Drummer's Coatee, Scots Fusilier Guards, about 1840.

(7112). Officer's Dress Coatee, 1st Royal Regiment (Royal Scots), about 1820.

(7113). Staff Officer's Dress Coat, of about 1745.

(7114). A Soldier's Coat, with pewter buttons, Royal blue facings, regiment unknown, of the period of 1745.

(7115). A General Officer's Coat, of about 1750, a very fine specimen, the buttons have the baton and sword crossed.

(7116). Officer's Dress Coatee, of the Aberdeenshire Local Militia, 1809.

(7117). Drummer's Coatee of the 67th Regiment of Foot, 1840.

(7118). Soldier's Bob-Tailed Coatee, of the 71st Highland Light Infantry, 1830.

(7119). Officer's Dress Coatee, of the Royal Engineers, with light blue collar and cuffs, 1840.

(7120). Officer's Dress Coatee, of the Royal Marines, 1850.

(7121). Officer's Dress Coatee, of South Shropshire Local Militia, about 1810.

(7122). Trumpeter's Coat of the 27th Light Dragoons, about 1800. The buttons are of French make. This Regiment was raised in 1795, its uniform was French grey with yellow facings (the coat itself is yellow), it served in St. Domingo, in South Africa and in India. In 1802 it was re-numbered 24th Light Dragoons, and was disbanded in 1818. The Regiment was granted the badge of the Elephant, circumscribed Hindoostan, for its distinguished services in India.

(7123). Levee Dress Cocked Hat with white plume, of the 6th Dragoon Guards (Carabiniers) of 1830.

(7124). Officer's Brass Helmet, of the 4th Dragoon Guards, 1840.

(7125). Officer's Shako, 22nd Cheshire Regiment, 1840.

(7126). Bronze Peace-Victory Medal (obverse and reverse), struck at the Mint, Birmingham, in 1919. It was designed by Monsieur Emil Leindauer, the designer of the new French nickel coinage.

(7127). A Prussian Helmet of the Garde du Corps, surmounted by the single headed eagle; there were two Regiments named after the Kaiser and the Kaiserin.

/7128). A French Dragoon Helmet, of the period of Napoleon I.

(7129). Two German Spurious Coins, made from the metal of cartridge cases at Dar-es-Salaam, and used for the payment of their Askari troops in German East Africa, in 1915.—Given by H. Curtis, Esq., F.R.C.S.

(7130). A Metal Watch Chain, with a Prussian Military Cross attached to it, taken from the body of a German soldier in 1918. The Cross is the Military Cross of Honour, instituted in 1825 to celebrate the 10th anniversary of the Battle of Waterloo, the date 1831, and to commemorate the Frontier Operations in Silesia against Russia. Silesian Landwehr Army Reserve is doubtless the corps to which the original recipient must have belonged. The German soldier from whom it was taken was wearing his ancestor's " cross of Honour " for luck in the recent war.

(7131). Silver Badge, which was carried by the Officers specially appointed in the early part of the Great War (1914-1918) to carry secret and important despatches between the War Office in London and the General Headquarters of the British Expeditionary Force in France. Twelve such passes were manufactured of which only eleven were issued, the twelfth being presented, at the close of the War, to the Museum of the Royal United Service Institution.—Given by the Army Council.

(7132). German Official Post Office Dating Stamp and Seal, of their late Postal authorities in the Cameroons, West Africa; they were recovered in 1915, whilst excavating at the rear of the Post Office building in Victoria.—Given by M. J. Cooper, Esq.

(7133). Officer's Busby Badge, of 101st Royal Bengal Fusiliers, now Royal Munster Fusiliers, worn up to 1878.—Given by Lieut.-Colonel S. T. Banning, late Royal Munster Fusiliers.

(7134). Range Finder which was on the German Cruiser " Breslau." It was taken off that ship with certain guns and sent to Port Ayas, in Cilicia, for defence purposes; when the Armistice was signed it was removed by a German officer and sold to a Turk at Djihan (35 miles east of Aden), in whose house it was found by a search party of the 19th Indian Infantry Brigade.—Given by Brigadier-General A. Mudge, C.M.G.

(7135). Two Mexican Dollars, taken from the German Cruiser " Emden," made into souvenirs to commemorate the sinking of that ship by H.M.A.S. " Sydney," on November 9th, 1914, and sent by the Australian Commonwealth Authorities for distribution to the Lords Commissioners of the Admiralty.—Given by the Secretary of the Admiralty.

(7137). A Silver Statuette of the figure of Victory, with two lions at the base of it, bearing the following inscription :—" Presented by the Captain and Officers of H.M.S. ' Lion ' to the Captain and Officers of H.M.S. ' Indomitable,' to commemorate a very excellent 6½" hawser, January 24-25, 1915" (The Battle of Jutland).—Given by the Ward Room Officers, H.M.S. " Indomitable."

(7138). A Stoker's Shovel, bearing the following inscription on a silver plate :—" H.M.S. ' Indomitable.' Shovel used by H.R.H. The Prince of Wales, in No. 4 Stokehold, during record trip from Quebec, August, 1908."—Given by the Ward Room Officers, H.M.S. " Indomitable."

(7306-8). The following Medals and Clasps added to the Mint Collection (483 and 6522) of Naval, Military and Air Force Medals, which complete that collection to the end of 1919 :—

Military Cross with Clasp.
Royal Navy, Conspicuous Gallantry with Clasp.
Royal Navy, Distinguished Service with Clasp.
Military Medal with Clasp.
Distinguished Flying.
Royal Air Force.
African General Service with six Clasps.
Sudan, 1913, with Clasp.
1914 Bronze Star.
1914-15 Bronze Star.
Antarctic, 1910-16, with three Clasps.
Antarctic, 1910-16, Bronze, with two Clasps.
Meritorious Service, Royal Navy.
Meritorious Service, Royal Air Force.
Meritorious Service, Canada.
Meritorious Service, Australia.
Meritorious Service, New Zealand.
Distinguished Service, India, with Clasp.
Royal Navy, Good Shooting, 24 additional Clasps.
—Given by the Lords of the Treasury.

(7309). A Series of Coloured Engravings, by Adam & Armont, of Paris, depicting scenes of the Removal of the Body of Napoleon I. from St. Helena to Paris, in 1840.—Given by The Lord Blyth.

(7310). A Portrait in Water Colour of Lieut.-General Sir John Moore, K.B., after the picture by Lawrence. Painted by Lady Leetham.—Given.

(7311). Officer's Shaco, of the 69th Foot, worn up to 1860.—Given by Mrs. Scott-Turner.

WOLSELEY ROOM.

(7140-71). A Lacquer Case (No. 1) containing the following exhibits :—

1. A small Enamelled Danish Cross, with ribbon surmounted by the Royal Crown bearing the initial "A" with a diamond in the centre. Given to Lady Wolseley by Queen Alexandra in 1902, in commemoration of her work in connection with a hospital ship during the Boer War. At the back of the cross is the following inscription :—" Alexandra." " Faith, Hope and Charity. 1899-1902."
2. King Edward VII.'s Volunteer Decoration (Miniature). Bestowed on Lady Wolseley.
3. Queen Victoria's Jubilee Medal (Miniature), 1887.
4. The Khedive's Bronze Star, Egypt, 1882. Bestowed on Lady Wolseley by H.H. The Khedive of Egypt.
5. King Edward VII.'s Coronation Medal, 1902. Bestowed on Lady Wolseley.
6. A small Gold Token. On the obverse is a shamrock with the Irish harp in the middle, surmounted by a crown. On the reverse is a portrait of Queen Victoria, Ireland, 1900; being a souvenir of Her Majesty's visit.
7. King George V.'s Coronation Medal, 1911. Bestowed on Lady Wolseley.
8. The Insignia (2) and Ribbon of the Turkish Order of Shefakat. Bestowed on Viscountess Wolseley by the Sultan Abdul Hamid in 1901 (with document).
9. An Enamelled Tortoiseshell Box, inlaid with gold, brought from Russia by Lord Wolseley and given to Lady Wolseley.
10. A Gold Locket containing the hair of Field-Marshal the Duke of Wellington, dated 18th June, 1844.

11. A King's Messenger Badge (The Greyhound) of George III. period.
12. A small Silver Cylindrical Box containing French silver coins (41) of the period of Louis XIII. and Louis XIV., probably used as counters.
13. A small Silver Cylindrical Box containing a number of silver coins, of various countries, of the period of Queen Mary. They were probably used as counters.
14. A Locket, richly embellished with diamonds, bearing the initial "W," and at the back a piece of Field-Marshal Viscount Wolseley's hair. The original locket was given to Lord Wolseley by Lady Wolseley when the latter was only 18 years of age. He always wore this up to the time of his death. The diamond decorations were added after his death.
15. A Bone Cylindrical Match Box which was given to Lord Wolseley by a Voyageur of the Red River Expedition and used by him daily.
16. A Gold and Blue Enamel Watch, made by Barwise of London, with chatelaine and seals; a gift of Lord Wolseley to Lady Wolseley.
17. A Pair of Scissors, with Pencil, in enamelled case.
18. A Mother-of-Pearl and Silver Patch Box, of French workmanship. Inside a number of smaller boxes are fitted.
19. A Miniature Note Book in tortoiseshell and silver.
20. A small Silver and Tortoiseshell Box, with portrait on the lid of Queen Anne, which it is believed to be by d'Obriot and bears his initials.
21. A large Silver Medal of King Charles II
22. An old Russian Enamelled Box, which was given by H.I.H. the Duchess of Edinburgh to Lord Wolseley, at Moscow, in 1883.
23. A Russian Lacquer Snuff Box. On the lid is depicted a guard mounting, in red and green uniforms.
24. A Miniature in embossed gilt frame. On the back it is inscribed:—"Mistress Helen Wolseley. B. 1647, M. 1676, Rev. Thomas Pratt, Bishop of Rochester. D. 1725. Buried in Westminster Abbey." By Flatman.
25. A small Silver Nutmeg Box, inside it is fitted with a grater. George III. period.
26. A small Silver-Gilt Bowl with enamels. Probably Russian.
27. A large Magnifying Glass in tortoiseshell case with silver mounts.
28. A small Silver Box with hinged lid and elaborate monogram; of the period of Queen Anne.
29. A small Oval Silver Box. Inside the lid is a water-colour painting of a lady holding a fan to her face. Probably of the period of King George I.
30. A Gold Medal of King George IV. On the reverse is inscribed:—"Born 1762. Died 1830."
31. A Miniature, painted by Turrell, in gold frame; the back is blue enamel and contains a lock of hair. Round the edge is engraved:—"Louisa, Viscountess Wolseley, Born 1843."
32. A Blue Enamel Pendant set with diamonds. On the back is engraved:—"The Order of Elderly Merit, conferred on Louisa, Viscountess Wolseley, by her husband and daughter, January 27th, 1900."
33. A small Bloodstone Bowl with silver mounts.
34. A Seal with the arms of Lord Wolseley, the handle is of silver, representing an owl on its nest.
35. A small Gilt Flat Case with classical figures on it. Probably French.
36. An Ancient Silver Box. Probably French.
37. A Seal with a jewelled silver-gilt handle; on the top is a dog. It formerly belonged to Lady Clementina Villiers, who was a well-known beauty in her day. The motto on the seal is as follows:—"Vivre pour esperer et puis mourir."
38. A small Russian Cross in Silver, with blue enamels, with inscription in Russian.
39. A Miniature set in gold frame. On the back is inscribed:—"Portrait of Boileau by Petitot. Given to Colonel G. J. Wolseley at the door of the Summer Palace, Pekin, in 1860, by a French Bombardier. Wolseley,

F.M., 1902." The Boileau of the miniature was Nicholas Boileau, 1636-1711, the well-known poet and satirist of the reign of Louis XIV.

40. A small Silver Box with a mounted figure of Frederick the Great on the cover. Inside the box are a series of water-colour pictures depicting his victories.
41. An Enamelled Locket mounted in gold, containing the hair of Queen Adelaide, wife of King William IV.
42. Two Gold Seals which belonged to Lord Wolseley.
43. Watch given by Lieut.-General Cromwell to General Fairfax.
44. A Miniature by Cosway, in gold case, of a lady's head. On the inside of the case is inscribed :—" Beloved till life can charm no more, and mourned till pity's self be dead."
45. A Silver Pocket Sun Dial with compass, made by Butterfield, Paris. On the back are various inscriptions.
46. A small Gold Pocket Compass with Lord Wolseley's arms on it.
47. A small Gold and Red Enamel Brooch, given by Queen Alexandra to Lady Wolseley, with the Royal Crown and initials in diamonds on it. Round the border is inscribed :—" South Africa, 1900."
48. A small Silver Bowl, of German make, commemorating the Battle of Leipzig, October, 1813.
49. A small Ivory Handglass mounted in silver. On the back is a portrait of a lady of the period of Queen Anne.
50. An Antique Paste Pendant, being the last gift of Lord Wolseley to his wife on her 70th birthday, January 27th, 1913.
51. A large Blue Enamel Locket, mounted in gold, containing the hair of Lord Wolseley on one side and of Lady Wolseley on the other.
52. A small Gold Token which belonged to Queen Henrietta Maria, wife of King Charles I.
53. A Loyalist Badge, depicting King Charles II. when a boy.
54. A large Gold Ring with contemporary portrait of John Pym, the Parliamentary General. Given to Lord Wolseley, in 1884, by Lord Saye and Sele.
55. A Horn Snuff Box with silver lid and base. The top contains a Loyalist Badge, which is hinged, with portrait of King Charles I. on it and the Stuart Royal Arms.
56. A small Silver Gilt Russian Cross of St. George. Lord Wolseley bought it from a French soldier whom he saw cut it from the breast of a dead Russian at the Battle of the Tchernaya, 1855.
57. A French Seal. The handle is a bust of Louis XV.; at the base are the arms of Lord Wolseley.
58. Badge of the Pitt Club, which belonged to the Rev. Henry Jones, of Menai. The Pitt Club was formed to commemorate the Right Hon. W. Pitt, who died on the 23rd January, 1806.
59. Gold Ring of the Lord Chancellor of Ireland, with the motto :—" Vincit qui Patitur."
60. Five Antique Tea Spoons of Queen Anne period.
61. A Gold Scarf Pin with the harp and crown in diamonds ; given by H.M. King Edward VII. to Lord Wolseley when he accompanied the King to Ireland as Goldstick.
62. A Gold Scarf Pin with the badge of the Grenadier Guards. The back contains a portion of the Duke of Wellington's hair.
63. Eight Scarf Pins which belonged to Lord Wolseley.
64. A Gilt Scarf Pin with the badge of the 90th Light Infantry.
65. A Gold Ring with Napoleon I.'s portrait on it.
66. A Gilt Shell, forming a smelling salts box. French.
67. A long Steel Stiletto, with engraved handle.
68. A Tortoiseshell and Silver Snuff Box which belonged to General James Wolfe.
69. A small Gilt Token. On the obverse is a portrait of General Sir Robert Baden-Powell, and on the reverse a gentleman in khaki, 1899-1900.

(7718-7200). A Lacquer Case (No. 2) containing the following exhibits :—

1. A Gilt Medallion of Lord Nelson, in marble frame, which Lord Nelson had given to a relative of Lady Abinger's, who presented it to Lord Wolseley.
2. An Ivory Medallion, with contemporary portrait of the Duke of Marlborough in relief, and framed in oak.
3. A Bronze Medallion of the Duke of Marlborough, in ebony case. Given to Lord Wolseley by Mrs. S. Glyn in 1890.
4. Gold Coronation Medal, mounted in ebony ; given by H.I.H. the Emperor Alexander III. of Russia to General Lord Wolseley at the Coronation Ceremonies, Moscow, 1883.
5. Bronze Commemorative Medal of the South African War, mounted in ebony.
6. A Silver Medallion of the Empress Josephine, by Andrieu, framed in ebony.
7. Bronze Medallion of Napoleon I., holding in his arms the King of Rome, dated 1811. By Andrieu. Framed in ebony.
8. A Silver Medallion of the Empress Marie Louise, by Andrieu. Framed in ebony.
9. A Gold Cup with handle, with cattle embossed on it, bearing the following inscription :—" This is the exact copy of Hector's gold cup found at Troy and now in the Museum at Athens, was presented by King George of Greece to His Excellency Field-Marshal Viscount Wolseley, Ambassador Extraordinary on the occasion of his visit to the Court of Athens, to announce the accession of H.M. King Edward VII. 1901."
10. A portion of an Elephant's Tusk with a number of figures carved on it; made by Loanzo, a native of Kwitu-Madi River, West Africa.
11. Seven Friction Tubes, which were made by General Gordon in Khartoum during the siege. He used percussion caps with each. 1885.W.
12. A portion of old Regimental Lace which belonged to the Buffs, of the period of 1775.
13. A Charm in the form of an anchor, with medallion of Lord Nelson in the middle. The charm was a very popular one amongst sailors of the period. This specimen was worn by one of the pall bearers at Lord Nelson's funeral.
14. A Regimental Button of the 90th Light Infantry, worn by Lord Wolseley when he was in that regiment.
15. A German Iron Cross. 1813.
16. A Gold Cigarette Case with jewelled ornament in the centre, bearing the following inscription :—" Presented by H.M. the Sultan to His Excellency Field-Marshal Viscount Wolseley, on the occasion of his visit as Ambassador Extraordinary to the Port to announce the accession of H.M. King Edward VII."
17. A number of tiger's claws from the necklace of the Zulu King Cetewayo.
18. A Pair of Antique Spectacles in Shagreen case.
19. Gold Military Medal of Montenegro ; given to Lord Wolseley at Moscow in 1883, by the Prince of Montenegro. This medal was missing for some years, and a duplicate was supplied and will be found amongst Lord Wolseley's medals.
20. A Gold Jewelled Casket, with miniature of the Emperor Alexander III. on the cover, bearing the following inscription :—" Presented to Lord Wolseley by the Emperor Alexander III., at the Coronation at Moscow, June, 1883."
21. A Carthaginian Coin which came into Lord Wolseley's possession in 1904.

22-23. Two Egyptian Decorations, made at Khartoum in 1884 by General Charles Gordon's orders.

24. A piece of Pavement from the Sistine Chapel, Rome ; dated 1907.

25. A small Soudanese Dagger with horn handle and silver mounts. It was obtained by Lord Wolseley during the Nile Expedition, 1884-5.
26. A Miniature Portrait of King Charles of Roumania, framed in jade and gilt. At the back is the following inscription :—" Presented by H.M. Charles of Roumania to His Excellency Field-Marshal Viscount Wolseley, upon the occasion of his visit as Ambassador Extraordinary to the Roumanian Court to announce the accession of H.M. King Edward VII., 1901."
27. Three Mathematical Instruments which were constantly used by Lord Wolseley.
28. A Patent Pipe Lighter, marked " Sir Garnet Wolseley, 1878."
29. The Handle of a Dagger in ivory. It is thought to be Scotch and of very ancient date.
30. General Charles Gordon's Cigarette Case, which he gave to Lord Wolseley the day he left London for Khartoum, January 13th, 1884.
31. The Badge of the Grand Lodge of Irish Druids. Number 245, John Borron, 16th February, 1789.
32. One of the Silver Coins which were thrown to the people at the coronation of the Czar in 1883.
33. Admiral Vernon's Medal, dated November 22nd, 1789.
34. Arabi Pasha's Visiting Card, in frame, taken from his tent by General Sir Garnet Wolseley in 1882.
35. A small Gilt Aneroid, used by Lord Wolseley during the Indian Mutiny and in his subsequent campaigns.
36. A Silver Egyptian Coin.
37. A small Leather Purse which belonged to Lord Wolseley.
38. A Gold Cigarette Case, with a horseshoe in rubies on the cover, with the following inscription :—" Presented to Lord Wolseley by H.R.H. the Duchess of Edinburgh, Moscow, June 4th, 1883."
39. A Commemorative Medal, which was sold in London, of the 1882 Egyptian Campaign.
40. Bronze Medal to commemorate the wedding of Prince Henry of Battenberg and Princess Beatrice of England. Dated 23rd July, 1885.
41. A Bronze Medal, struck to record the return of the City of London Imperial Volunteers from the South African War, October, 1900.
42. A Bronze Commemorative Medal of the coronation of King Edward VII. and Queen Alexandra.
43. Two Bronze Medals presented to Lady Wolseley by Lieut.-Colonel Routledge and the officers of the 2nd V.B. Royal Fusiliers in 1883.
44. A Bracelet of Ageri Beads with gold emblems between each bead, said to be of great value in Ashanti.
45. A portion of Shrapnel Shell labelled " Pieter's Hill, Boer War, 1900."
46. A Bead which formed part of a necklace found in Hannibal's Palace at Carthage and given in 1904 to Lord Wolseley at Tunis.
47. A very ancient Assyrian Seal (Cylinder of Hæmatitie).
48. An Egyptian Amulet mounted in gold.
49. An Ashanti Gold Charm given by Colonel Sir Baker Russell to Lady Wolseley in 1883.
50. A small Pocket Compass. On the back is inscribed :—" Given to Colonel Garnet Wolseley by Governor Archibald, Fort Garry, Red River, 1870."
51. A heavy native South African Silver Bangle, much embossed.

(7201). A Walnut Cabinet containing the uniform of the Royal Horse Guards (Blues) worn by Field-Marshal Viscount Wolseley as Colonel of that Regiment from 1895-1907, during which period he held the office of " Goldstick."

NOTE.—The list of the remainder of the collection will appear in the following JOURNALS.

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GOLD MEDAL (MILITARY) PRIZE ESSAY FOR 1919.

Subject:

"THE APPLICATION OF RECENT DEVELOPMENTS IN MECHANICS AND OTHER SCIENTIFIC KNOWLEDGE TO PREPARATION AND TRAINING FOR FUTURE WAR ON LAND."

By BREVET COLONEL J. F. C. FULLER, D.S.O., Oxfordshire and Buckinghamshire Light Infantry.

Motto.—"Race horses don't pull up at the winning post."

PART I.—FORESIGHT.

1.—THE SCIENCE OF WAR.

TO understand the past and to judge the present is to foresee the future. To understand is to see through, to judge is to value and decide, that is to think logically before a decision is arrived at; consequently, in order to appreciate the worth of a proposition, it is necessary to discover the facts which underlie it and to reduce these to the general terms of a theory; in other words, to think and work scientifically.

Warfare is both a science and an art. As a science, it consists of certain elements governed by definite laws or principles; as an art, of the application of these principles to the ever-changing conditions of war, which are seldom if ever the same.

Further than being a science, warfare includes the essence of many sciences; it is quint-essential, it forms the apex of a pyramid, the base of which is foursquare and represented by physical science, moral science, applied science and pure science. It is, therefore, connected far more intimately than has hitherto been recognized with the progress of civilization and all that this progress stands for. Consequently, we find that the art of generalship and of soldiership is not to be learnt by merely "reading and re-reading the campaigns of the great Captains of war," as Napoleon bade us do, and by practising certain evolutions on the training ground, but by appreciating what is evolving around us in the peaceful fields of the physical and moral sciences—engineering and mechanics, philosophy, industry, commerce, psychology and the general progress of mankind. By doing so we shall be enabled to fashion an economic army, that is an organization for national self-preservation, which at a given moment will be able to convert the energy of peace into the force of war in the shortest time and at the least possible cost.

2.—The Anatomy of an Army.

Scientifically an army is a combination of four elements—men, movement, weapons and protection; a fifth element—ground—might be added, but this is included in "movement," as are air and water, which are mere vehicles of motion. From these four elements spring the theory and practice of tactics, or fighting, which is the art of combining movement and the use of weapons for destructive and protective ends.

In order to appreciate the problem set forth in the title of this essay, it is necessary, briefly to analyse the nature of these elements, for by so doing, we shall not only discover their characteristics, but how far the sciences may be utilized in their development.

Taking the human element first, we find that just as in civil life we may divide mankind into two general categories—the thinkers and the workers, so also in an army does the same division hold good, though these terms at present become more intelligible if we substitute for them those of orderers and obeyers.

The orderers include the commanders and the leaders who form the brains and senses of the army; the obeyers, the carriers and fighters of weapons and the suppliers—the muscles, bones and internal organs; between these two exists a link—the staff—acting as the nervous system of the whole military body.

Though a commander must possess foresight, imagination and energy, his chief duty is to think logically (scientifically), that is, to judge the true value of the conditions under which he will be called upon to act. This duty has in the past been frequently misconstrued, it having been left to the staff to evalue the evidence and to the commander to accept this evaluation at the price of the staff, and so issue his decision upon facts he has not reasoned out. As in human

physiology such a process would be a limitation of the functions of the brain, equally so is it a limitation in the mental organization of an army, for unless a commander has the power of arriving at his own evaluations, his judgment will be apt to be blurred by reasons which are not his own. A commander, therefore, must be as much his own Chief of the Staff as head of his leaders and no man realized this more fully than Napoleon—the greatest combined C.S.O. and C. in C. in all history.

Information is the evidence upon which judgments are made; it is collected and sorted by the staff and should be, as we have seen, evalued by the commander. Information of the enemy and our own troops comprises the most important conditions under which war is waged, the commander analyses these and, by means of the "acid test" of principle, synthetically builds up his plan of action on the values thus derived.

During the Great War the means of obtaining information have been enormously multiplied by the mechanical and electrical sciences. Aeroplanes, motor-cars and range and flash spotting apparati have, like great vortex rings, raised the fog of war, so that, on occasion, a commander a hundred miles away can "appreciate" the dispositions of his enemy's forces more distinctly than Wellington could "see" those of Napoleon on the field of Waterloo.

As a commander requires analytic and synthetic perception in order to sort facts from fictions, so does a leader require analytic and synthetic insight in order to understand human nature—the heart of man, brave, prudent and fearsome. He has in fact to be a psychologist of high order, for the led under him are not only singly individuals thinking in terms of self, but collectively, a crowd swayed by instinct and contagion, ruled by suggestions and cemented together by the repetition of their duties and the prestige of their leader.

Individually and collectively, the soldier is led by "comfort" and "safety," and of all the weapons in a leader's armoury, these two are perhaps the most potent, for as the former controls the body so does the latter control the mind of his followers.

Lastly, in the category of the human element of war, do we come to the man himself, the obeyer, whose duty comprises not only carrying out orders but "playing for the side." He is not only an individual but one out of a mass of individuals, a military society—the Army—which, like any other society, falls under the sway of the sciences of heredity, sociology, medicine and education.

As combatants, soldiers may be placed under two categories—the workers of weapons and the carriers of weapons, both require skill, that is training; but the latter require additional endurance, for whilst supporting or carrying his weapon the soldier is little better than a bipod or human gun mounting with few of the advantages of a nerveless instrument.

Endurance brings us to our second element of war—movement, which is mentally and bodily its co-efficient. Of movement there are two main sources—muscular and mechanical. As continuity of movement, or the keeping of it alive, is one of the fundamental difficulties of

war, supplementary means have always been sought whereby human endurance may be increased. Throughout the history of war this has been recognized and when weapons permitted of it, soldiers fought on horses, elephants, in chariots, anything rather than on their own legs, the limitations of which they fully appreciated. To-day machinery is rapidly replacing muscle and the introduction of petrol on the battle-field is ushering in a new epoch in the art of war—the epoch of the mechanical engineer.

The above two elements lead directly to the third—weapons—the tools whereby the moving or stationary man imposes his will upon his adversary.

There are two types of weapons—weapons which can be wielded at close quarters and weapons which can be thrown when at a distance. The effective use of both depends on certain requirements, namely, all weapons require a propellant, all weapons require direction and, in the case of missile-throwing weapons on land, direction, that is, accuracy of fire, is most difficult to obtain without substituting a mobile platform for the human gun mounting. In the past the horse has been used at times to enable fire to coincide with movement; as now at sea, so in the future on land, will machinery enable this great advance in fire tactics to be accomplished.

The Great War gave birth to a considerable number of new and improved weapons of the missile-throwing class, and though all of these were necessary adjuncts to the one great object of battle—"the giving of blows without receiving them," the raising of special corps and units to handle these weapons possessed one inherent defect—the weakening of co-operation through the multiplicity of means and the difficulty of reducing these means to the limitations of a common denominator—the infantry soldier.

This fact is mentioned here as it is of sufficient importance to form eventually the main postulate in the suggested solution to the problem of this essay. It is no new difficulty, in fact it dates back to some pre-historic period when primitive man discovered that he could hurl as well as hit.

As late as the days of Napoleon the problem was manifest, for was it not this great captain who said: "I do not want various types of infantry, I want one type—good infantry"? And since this essential remark was made the problem of co-operation has grown more and more complex, so much so that, setting aside shock weapons—bayonet, sword and lance—we are now compelled to divide our second category, "missile weapons"—bullets and shells—into three sub-divisions:—

(1) Short-range weapons—rifles, machine guns and tanks.[1]

(2) Long-range weapons—guns and howitzers, horse and machine-drawn.

(3) Mobile weapons—cavalry, tanks and aeroplanes.

These sub-divisions, though very general in nature, will be found to possess the virtue of directing us through our argument and of keeping us, so to speak, on "the rails" which lead towards simplicity of organization.

[1] The tank when dealt with in this essay is always a post-war type.

3.—Scientific Summary.

It has already been stated that not only is warfare a science, but a compendium of many sciences. In the above introductory notice on war and the anatomy of an army, several definite sciences have been mentioned and many more referred to. All these sciences have received during the war an enormous military stimulus which will re-act on their civil organizations. Their development has been immense and though it is not intended here to enumerate all, it is instructive to further argument to summarize the most important of these systems of knowledge.

Table I.

Organization.	Elements.	Science.	Common Equivalents.
Army	(A) Men and Movement.	Logic.	Movement of Thought.
		Psychology.	Movement of Soul.
		Physiology.	Movement of Body.
		Education.	Construction of Mind.
	(B) Weapons and Movement.	Electricity.	Movement of Information
		Chemistry.	Movement of Projectiles.
		Mechanics.	Movement of Materiel.
		Engineering.	Construction of Weapons.

This summary is not intended to represent a technical analysis of the forces which underlie strategy, training, and tactics, but is merely illustrative of some of the problems which must be solved before a just appreciation can be obtained of the influence of recent scientific development on the science and art of warfare. This development will be dealt with in the next two sections.

4.—Development of the Sciences of Understanding.

Though the sciences of understanding, as tabulated under (A) of Table I, form the basis of those of action under (B), it is not proposed here to discuss at length their development during the Great War, for this development has in many cases been indirect, and consequently it is not so obvious to the unphilosophic mind as the more material ones; nevertheless, their importance is paramount, forming as they do the dynamic force in the art of warfare.

Logic.—When an unbiassed philosophical analysis of power of judgment exercised by the higher commanders in the Great War is made, an astonishing discovery will follow, namely, that most of their actions were based on chance and the misinterpretation of events rather than on skill and foresight, this being due to the inchoate condition of their knowledge of the science of war.

The "weighing out" of information is one of the chief duties of the logician, and under the stress of war this can only be accomplished by an individual of normal intellect by reducing the numerous

conditions under which he is called upon to act to a limited category of events, and then to arrange these events in accordance with the unchanging principles of war.

Thus it will be found that the main conditions of war may be summarized under twelve headings:—

1. Time.
2. Space.
3. Ground.
4. Weather.
5. Numbers.
6. Moral.
7. Communications.
8. Supply.
9. Armament.
10. Obstacles.
11. Formations.
12. Observation.

These twelve in their turn may be reduced to two—"endurance" and "resistance"; thus the endurance of the attacker must be superior to the resistance of the attacked.

Having analysed and evalued the conditions, the next step is to arrange them systematically so that the fighting troops may possess the greatest power of stress and strain. Here the principles of war come to the assistance of the commander. These principles are:—

1. The principle of the objective.
2. The principle of the offensive.
3. The principle of security.
4. The principle of concentration.
5. The principle of economy of force.
6. The principle of movement.
7. The principle of surprise.
8. The principle of co-operation.

Space does not permit here of further explanation, but as an illustration the following may be taken as an example of a logical plan for an attack:—

To advance against the enemy's main force (objective), with the intention of destroying it (offensive) with the greatest strength possible (concentration and economy of force), with the least friction (co-operation) in the shortest possible time (movement), so that it may be taken unawares (surprise) without undue risk to ourselves (security).

Psychology.—Before the Great War no single British book existed on the psychology of the soldier; within three months of its outbreak one was published consisting of 122 pages. This in itself illustrates sufficiently clearly the astonishing neglect in the essential science of leadership. Though this deficiency has not yet been made good, nearly every military book and article now written bears directly or indirectly on "moral," and such a vast amount of material is pouring in from all sides that, in a short period from now, it will

be possible to produce a detailed empiric work on this subject which should completely revolutionize our pre-war methods of military training and education, which are the foundations of leadership in war.

One of the fundamental psychological lessons learnt during the Great War was that a soldier possesses a "soul" as well as a "mind," and that an army is governed by "catch words" (soul stirrers), and not by reasons (mind awakeners).

Had British officers, prior to the Great War, carefully studied Gustave le Bon's "Psychology of the Crowd," the most potent military weapon would have been placed in their hands during it—a weapon which, throughout this war, they were always groping for, and few had the skill to wield even when they found it. "The soldier is governed through his heart and not by his head." These were the words of Ardant du Picq, who was killed in 1870, and they still form the greatest psychological maxim of leadership.

Physiology.—Under its military interpretation, physiology may be viewed as the science of medicine and the science of physical training, the object of the latter being to eliminate the former. As regards the former, it is not intended to say more than that, since 1889, the R.A.M.C. has evolved from what may be considered an alchemical brotherhood to a supremely scientific organization. The development in surgery and medicine in the last few years has been truly bewildering, and though it is an undoubted fact that the influx of civil doctors and surgeons into the Army during the Great War accelerated this development, it is, nevertheless, a pleasure to record that the R.A.M.C. stood the test of war better than any other military service, this being due to its high scientific pre-war training tempered throughout the war by common sense.

A vigorous and healthy body is the foundation of a vigorous and healthy mind. Prior to the Great War the system of physical training existing in the Army was apt to induce bodily fitness mechanically rather than psychologically, e.g., dumb-bells were used in place of will power. The war disclosed the clumsiness of this system of "health by numbers," and replaced it by a system which so arranged the exercises, the alphabet of the science, that the man's mind trained his own body through "health by suggestion," and found pleasure in so doing. Once again the system of appealing to the heart rather than to the intellect triumphed, and with astonishing results, so astonishing that it would be a wise act of Government if the "New Model Physical Training" was placed on a national footing, for not only would it help in the elimination of ill-health, but of social discontent as well—the policeman could then "move on" with the physician.

Education.—There are two main developments in education which may be traced during the period of the Great War: the first is, that an educated man is easier to train than an uneducated; the second, that the period of training can be reduced in direct proportion as education is psychologically organized and is made interesting.

Before the war, years were frequently spent in turning out a trained infantryman; during the war this period was forcibly cut down to

weeks, and the finished article suffered so little by this reduction that he marched to Maubeuge. To return to the pre-war method of a seven years' apprenticeship to the rifle for the men, and from twenty to thirty years' to a battalion of rifles for the officers is inconceivable; we have got to reduce our specialists, and by doing so we shall increase our general efficiency. To condemn officer or man to years of exercise with one arm is to stultify the brain and place the body in penal servitude.

Another development which we have got to realise is, that as it is easy to turn an educated civilian into a skilled soldier, so will it be equally easy to turn an educated soldier into a wage-earning civilian; consequently, a man's period of military service must be looked upon from a dual standpoint—to safeguard national prosperity whilst he is in the Army, and to assure that this prosperity may be increased once he leaves it. This development, therefore, points to the necessity of the Army in the future becoming a "People's University."

5.—Development of the Sciences of Action.

In this section we abandon the esoteric for the exoteric, we stand on firm popular ground with tangible developments confronting us; developments every soldier has witnessed daily during the Great War and concerning which there can be no doubt.

Electricity.—Though that phase of energy named "electricity" remains in nature occult, little still being known concerning it, its utility, during the war, has been universal; without it no lorry or motor-car could satisfactorily have moved. Headquarters and other offices would have been reduced to a mediæval gloom, and telephonic and telegraphic communication could at best have been replaced by speaking tubes and visual signalling; in fact, the Great War could not have taken place as it did, it would, without electricity, have assumed quite another form.

The main electrical developments during the war fall under two categories; the general application of the telephone and telegraph as means of communication, and an entirely new development of ranging hostile weapons by "sound ranging" and "flash spotting," contrivances which enabled the location of guns to be pin-pricked on a map far more accurately than sight or hearing could ever have done.

Besides air line and cable communication, the practical application of wireless telegraphy and telephony have been considerable, so much so that, in July, 1918, a successful experiment was carried out in communicating between an aeroplane and a moving tank by the latter means, and though stress of events, between August and November, 1918, did not permit of this system of intercommunication being developed, there can be little doubt that within the next few years it will be found practicable for a Tank Battalion Commander to accompany his machines by aeroplane into battle and to issue to his subordinates verbal orders from a flying "fighting top."

That electricity, especially wireless, will be restricted to the work of intercommunication is in the future extremely unlikely, and now

that the ethereal transmission of electrical power has become so practical we must be prepared for revolutionary developments, such as the direction of projectiles by wireless means, the transmission of vision, as well as voice, and possibly the use of electricity as a lethal or paralysing weapon.

Chemistry.—From April 22nd, 1915, onwards, the chemist took his place in the ranks of the fighting men, and the greatest revolution in weapons, since the invention of gunpowder, became an accomplished fact. Anathematized at first, as every new weapon of war has been, gas as a weapon has come to stay, and the reasons for this are simple and self-evident: firstly, without it war will remain barbarous; secondly, with it wars may be made more humane. These two assertions require explanation.

It is not generally recognized that gas, tactically, is a direct descendant of the round shot; this may be explained as follows: A hundred and fifty years ago a round shot was a deadly projectile when fired or richochetted through a solid three-rank-deep line of men or the side of a square, but when once improvements in the musket rendered extended order feasible, its effect was much reduced. In order to increase the radius of destructive action of the round shot, it was replaced by a hollow shell filled with explosive; this increased the breadth of the danger zone from the calibre of the gun to from 25 to 50 yards. Still, as warfare progressed, the human target grew smaller and smaller; in the Boer War of 1899-1902, extensions between skirmishers had increased to 15 paces, but, nevertheless, the human target remained visible; in 1914, however, the deadly fire of machine-guns and quick-firing artillery forced the infantryman to abandon the indirect protection afforded by extensions and to seek the direct one by going to earth. The human target had now vanished, and though the explosive effect of shell fire was doubled, trebled and quadrupled, the spade succeeded in beating the gun. A new projectile—gas—was introduced in order to "hit" the now invisible target; in other words, this projectile multiplied the destructive radius of action of the shell many thousands of times, for by inundating an area by day or night all life was obliterated, whether in the open or in the shelters it contained.

Though cloud gas was little used in the last phases of the war, it must not be assumed that this form of the projectile is obsolete, the reason for its disuse being the difficulty experienced in its transport.

Once the small box respirator was perfected, gas lost its deadly effect, but it must not be taken for granted that because we were adequately protected against hostile gases during the last years of the war we shall be equally well protected in the future. This is self-evident, for to be protected against gas either a respirator must be constructed to counteract the poison or the outer air must be prevented from entering the lungs, and possibly even from coming into contact with the skin of the body. Though, during the war, it was comparatively easy to ascertain the nature of hostile gases by examining the enemy's respirators, this will not be possible during days of

peace. An example which will show the likelihood of this contingency arising is that even in 1918 we possessed a gas which would penetrate the German respirator, and had the war continued, this gas would, in all probability, have proved a decisive factor in bringing the war to an end. This particular gas was not lethal and this brings us to our second assumption, namely, that gas may in the future render war far more humane.

If war be considered from the point of view of a surgical operation, there is no reason why gas as a projectile may not be looked upon as an anæsthetic; in other words, that non-lethal gases will be used to send the enemy to sleep or to incapacitate him temporarily by sickness or paralysis. All that will then be necessary will be to gas the enemy and follow up this attack of asphyxiation by lines of stretcher bearers who will transport the enemy from his position into our "cages." A direct antidote to such an unromantic type of warfare will be given in the following paragraphs.

Mechanics.—As chemistry has given to the soldier an improved weapon so have mechanics given him an improved means of motion, and it is from this point of view that it is intended mainly to consider this subject, though it is fully realized that all weapons, ever since primitive man gave up fighting with his fists and teeth, have been of a mechanical nature.

The two great tactical difficulties, which perpetually faced the contending armies in the Great War, were exactly similar to those which have faced every general in every great war throughout history, namely, "how to obtain offensive superiority and how to maintain it?"

In a more comprehensive form this problem may be resolved into three headings, respectively referring to the three primary elements of war as affected by the fourth—protection:—

(1) How to keep men alive?
(2) How to keep weapons alive?
(3) How to keep movement alive?

The whole problem was one of "how to advance," which demanded as a necessity that the endurance of the attack should be superior to the resistance of the defence.

Anti-gas armour—the small box respirator—ruled gas out of account as a certain means of obliterating the defence. The terrific cost in casualties, reduction of endurance, by leaving the direct protection of trenches and moving across the open under artillery and machine-gun fire, prevented the attacker maintaining, for any length of time, superiority of fire, and consequently of movement, and a deadlock resulted. Artillery did not produce a solution because, whilst it reduced the endurance of the defence by obliterating the resistance of wire and weapons within the range of the guns, it created a new resistant—the "crumped area"—which prevented maintenance of the offence by the destruction of forward communications; the "crumped area" became as severe an obstacle to movement as wire.

The solution to these difficulties demanded the protection of the attacker from bullets, shrapnel and splinters, and the increase of road

capacity, i.e., power of maintaining the attack as it advanced from its railheads and left the good roads behind it.

This solution was arrived at by combining bullet-proof armour plates with a common agricultural machine—the field or cross-country tractor, which enabled not only the addition of direct protection to be added to indirect, but the multiplication of road capacity by the power of moving off roads as well as along them. Henceforth, paradoxical as it may seem, trenches walked and roads ran away.

From its inception the tank offered the armies which adopted it the following solutions to the three comprehensive headings of the problem of: "how to obtain and maintain offensive superiority." It rendered the soldier immune from the effect of bullets, shrapnel, and shell splinters; it provided him with a mobile ammunition dump which could move across trench, wire and field; it enabled him to dispense with his legs for movement, and, by substituting for them mechanical force, to expend the whole of his muscular endurance on the manipulation of his weapons—henceforth, he could become a true fighter of weapons by ceasing to be a human pack mule.

The change in the art of war effected by the introduction of the petrol engine on the battlefield has been *stupendous*, for it has opened a new epoch in the history of war to which we can find no parallel in land fighting, the nearest approach being the replacement of sails by steam as the motive means in naval warfare. Not only has it reintroduced the knight in armour and so harmonized movement and security, but, by securing the soldier dynamically, it has enabled him to move statically. It has, in fact, equilibrated movement and fire and by doing so has superimposed naval tactics on land warfare; that is, it now enables the soldier, like the sailor, to discharge his weapon from a moving platform protected by a fixed shield.

So colossal are the changes which this development of mechanical movement on the battlefield is likely to effect, that its very possibilities are apt to produce incredulity rather than enthusiasm in the mind of the "old-school" soldier, who, in the words of Erasmus, is only too prone "to identify the new learning with heresy and so make orthodoxy synonymous with ignorance." Let him instead apply to the problem of army organization which faces us the words of another famous man, Edmund Burke, as he applied them to the problem of national reconstruction of his day. "A state without the means of some change is without the means of its conservation." In other words, organization must be dynamic. So great, indeed, are these changes likely to be that, before glancing at the future, it will be of interest to reveal what some of them might have accomplished had the Great War ended in the summer of 1919 in place of the autumn of 1918. Perhaps these will help to dispel the doubt of the sceptics.

In 1914 and 1915 the objective of the attack was the enemy's infantry positions. In February, 1916, in an anonymous article entitled "The Principles of War with reference to the Campaigns of 1914, 1915," which appeared in the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION, it was pointed out that the objective should be the enemy's guns, and from the summer of 1916 until the end of the

war the enemy's artillery became the objective of the attack. In May, 1918, a suggestion was made which carried the tactical objective still further forward and placed it in the zone of the enemy's headquarter staffs—army, corps and divisional, which were located *behind* his guns.

The theory underlying this "revolution" in tactics was an extremely simple one. The enemy's forces were divided into two zones—the administrative zone of the staffs (brains) and the executive zone of the fighting troops (body). If the brains could be paralysed the body would cease to work, it would become disorganized and inoperative. The means to be employed, in order to effect this paralysis, were large numbers of high-speed tanks which, advancing under cover of smoke or moonlight, would make direct for the locations of the enemy's staffs and either destroy, capture or disperse these centres of thought. Under cover of this "barrage of demoralization" the attack was to be launched against the guns and infantry. The idea underlying these tactics was but an extension of a system of tactical penetration written prior to the Great War and propounded by a writer in the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION of November, 1914.

It will be seen from the above what stupendous revolutions in tactics were actually in progress when the Great War ended, and it must be remembered that progress was only beginning, the tank being but a three-year-old. This progress will, undoubtedly, continue as the machine develops, and of the many lines it may take but one will now be touched upon.

Attention has already been drawn to the fact that cloud gas went out of use on account of the difficulty experienced in its transport. Here the mechanic comes to the rescue of the chemist, for there is no difficulty in constructing a tank or cross-country tractor which will carry ten tons of liquid gas at a minimum speed of ten miles an hour. Five hundred of such machines could release as much gas in one journey as was expended by the British Army throughout the whole of the 1918 operations.

Are human destinies to be controlled by a "whiff of phosgene"? To this the mechanic again steps forward and his answer is an emphatic "No"! As already pointed out, it may be impossible to discover, during peace time, an "armour," in the form of a tin container of chemicals, which will counteract the effect of poisonous and corrosive gases, why not then abandon "chemicals" and revert to our old friend "steel plate"—the body of the tank, which can with greater ease be made airtight than a submarine watertight. Such a machine could be provided with a detector by means of which its crew would be able to gauge the quality of the outer air. Directly the gauge showed the air to be impure the hatches would be battened down and the tank, so to speak, "submerged," its crew being provided with oxygen or compressed air, and its engines, if necessary, run off accumulators. In principle, if not in detail, the tank will have developed into a "land submarine."

Engineering.—As the chemist has given to the Army a new weapon of war and the mechanic a new means of motion, so must the engineer give to it a new type of soldier, endowed with "the spirit of mechanism"

and equipped with the spanner. It is remarkable, indeed, to consider how completely the civilian with his knowledge of civil science, and not the soldier with his drill book, has revolutionized the entire art of warfare. Herein lies a great portent of the future: "An army based on the civil sciences will flourish, an army neglecting them must become moribund."

All armies in 1914 were moribund, for this maxim was unrecognized in the full, but as this state of mechanical coma was universal all armies went to war on approximately an equal footing of inefficiency.

In this paragraph it is not intended to trace the development of new weapons, though the importance of this development will be outlined in Section 6; but, instead, to accentuate the vital necessity of a new breed of soldier—the fighting engineer—not one who makes gabions and dugouts, the static worker, but one who fights in the van of the battle and who consequently takes precedence over all other troops.

"Economy of blood and efficiency of iron" must be the guiding stars of the fighting mechanic whose form already bulks large on the horizon of war, and the race he will run with all competitors will be a race for "quality" and not "quantity," perfection of weapons and not numbers of men. His "pace" must be "foresight," always a lap ahead, and to assist him maintain his speed he will require "imagination," which will form the subject of the second part of this argument.

PART II.—IMAGINATION.

6.—Strategy and Invention.

Looking back is the surest way of looking forward. True imagination is based on the solid foundation of reason, and, unless it is, it becomes but a mere delirium of the future. From what follows in this section the reader may be misled to believe that genius and its power in war is overlooked and that an attempt is here made to replace power of brain by power of machinery. This is not only far from being the case but diametrically the opposite from what is intended, for in place of replacing brain power it is proposed to enhance it, and to show not only how utterly irreplaceable it is but how essential it is to cultivate it now and from now on, and how essential it is to provide it with means of materializing its power through perfection of weapons.

Genius still controls the battlefield: let us make no mistake about this, but in an army of soldier-engineers it must also control the laboratory, the workshop, and the training ground; let us, therefore, now look back, and see what would have happened had it done so in the past, had "inventive spiritualism" and not "savage animalism" been the watchword of the years gone by.

Carlyle, historian and seer, and what better attributes can be united? from whom the above quotations have been borrowed, also said of man: "Without tools he is nothing, with tools he is all." Tools or weapons, if only the right ones can be invented, form 99 per cent. of victory, this is the secret of the "New Strategy," the rest is 1 per cent., and an historic example of this is as follows:—

In war, especially modern wars—wars in which weapons change rapidly—one thing is certain, and this is, that no army of 50 years before

any date selected would stand a "dog's chance" against the army existing at this date. Thus:—

(i.) Napoleon was an infinitely greater general than Lord Raglan, yet Lord Raglan would, in 1855, have beaten any army Napoleon could have led against him, because Lord Raglan's men were armed with the Minie rifle.

(ii.) Eleven years after Inkermann, Moltke would have beaten Lord Raglan's army hollow, not because he was a greater general, but because his men were armed with the needle gun.

Against the above might be quoted the fact that the superior French Chassepot, in 1870, was beaten by the inferior needle gun. This is true, but it must not be forgotten that the superiority of the Prussian field gun made up and over for any deficiency in rifle fire, and that in the French Army the 1 per cent., always essential, had dwindled to 01.

Thus might we continue our comparisons right up to the Great War, during which we had a series of vivid pictures thrust under our noses in such rapid succession and so close to our eyes that it is extremely doubtful whether many of us have read aright what they portend, namely—"That it is machine-power and not man-power which wins a war"—"inventive spiritualism"; in other words: "that war is primarily a matter of tools, and that the side which can improve its tools most rapidly is the side which is going to gain the greatest output." This was the reason why 59 British divisions were able to beat 99 German divisions between August 8th and November 11th, 1918. Had Napoleon, at Waterloo, possessed a company of machine-guns or had his men even been armed with the Minie rifle he would have beaten Wellington and Blücher combined, as completely as Lord Kitchener beat the Soudanese at Omdurman.

But how could Napoleon have had either of these weapons, for they were not invented in his day, they did not exist? This is the very point which requires accentuation, this is where invention becomes the backbone of strategy. Berthier was a supreme clerk, but he was not what every Chief of the Staff should be—a mechanical clairvoyant, a seer of new conditions, new fields of war to exploit and new tools wherewith to exploit them. Had Napoleon or Berthier, in 1805, placed down as a challenge to the mechanical intellect of France 25,000,000 francs for the invention of a weapon 100 per cent. more efficient than the Brown Bess it is almost a certainty that by 1815 he would have got it; that he would have won Waterloo and that the whole course of history would have been changed. If there is wisdom to be learnt from this let us grasp it. Without an incentive improvement is slow; with it, it is fast, and it is gold which sets the pace as is clearly demonstrated by the cross-Channel and Atlantic flights.

To-day we stand on the threshold of a new epoch in the history of war—the petrol age, and now that peace has been re-established are we going to content ourselves with the old unscientific methods of 1914? Are we going to wrangle about rifle trajectories and count our strength in bayonets and sabres? Are we going to write new "rules and regulations" on the experiences of past wars, which will never again be re-duplicated, and refuse to accept the outstanding lesson of the 4,000

years of the known history of war, namely, that "war is a matter of tools, and that the highest mechanical weapon nearly always wins"?

In 1888 the design of the tank, to all practical purposes, existed; in 1918, 30 years later, the tank proved the decisive weapon in the greatest war in all history. Had the War Office, in 1888, been mechanically clairvoyant, had it offered £1,000,000, as a prize for the best military machine it would have got it years and years before 1914; the idea existed, but the incentive was lacking because the heads of the Army, in 1888, had not even dreamt, in spite of naval progress, which shrieked at them "machinery," that invention is a correlative of strategy.

And what do weapons depend on? Design; and design depends on "brain-waves" and auriferous stimulants. If to-day we want a tank to swim the Channel, as feasible a proposition as the submarine, it is a very long process and a wrong one to wait until some benevolent civilian, after much toil, forces one down our throats like a nasty medicine. Why not instead resort once again to the cheque-book, that "Open Sesame" of all improvement, why not offer £1,000,000 for it, it will be cheap at the price. But before we can do so, we must create a staff whose knowledge and imagination can formulate a demand, and how this staff can be obtained will be discussed in Section 10.

7.—The Battle of the Future.

The battle of the future will tactically be totally unlike a battle of the past or present, but in principles it will be very similar to all great battles fought since the days of King Cyrus.

The conditions of the battle of the future will depend on one thing only: the condition of the mental leadership of the present, that is the comprehending in full the meaning of the words written above. In the past we have been obsessed by one supreme tactical idea, "the superiority of numbers of men at the decisive point." This idea, sound enough during the epoch of muscular warfare, will become a veritable hangman's rope if we continue to worship it. It is fighting power which we want and not numbers of men, the fighting power of machines which, as a new doctrine, will replace what is henceforth an obsolete and dangerous dogma. Have we the moral courage to accept the new idea and the energy to carry it out? We doubt it, for before us stands the serried phalanx of the "old school," who, like the ideal English Bishop of Mrs. Browning:—

> ".....must not love truth too dangerously,
> But prefer the interests of the Church."

But supposing that we have, that we cease thumping the empty bottle of 1914 or attempting to fill it with the new wine of 1919, which is still in the process of fermentation; then in fifteen years from now we can be well on the way of getting a new model army, an army of educated men, of formidable weapons and of astonishing movement, an army led by scientists and fought by mechanics—a true machine of war. Let us see what such an army might have to accomplish in battle.

The ideal army consists of one man and weapons, and as our present superiority increases over that of our neighbours so shall we approximate closer and closer to the ideal—our steel-shod Achilles. This idea may seem absurd, but it is not so. Take, for instance, the example of gas. As already pointed out, it is quite conceivable that many gases may be discovered which will penetrate all known gas armour. As there is no reason why one man should not be able to release 100 cylinders simultaneously, there is no reason why he should not release several million; in fact, these might be released in England to-day electrically by a one-armed cripple sitting somewhere in Kamtchatka directly his indicator denoted a favourable wind. This individual, if he destroyed the whole of the enemy's forces would constitute the ideal army—Achilles with an armoured heel.

In days of peace the chemist will work in his laboratory and the mechanic in his workshop and the General Staff will think out the future. Frontiers will be defended, but not as they are now, guns will be replaced by hidden reservoirs containing hundreds of thousands of tons of liquid gas. Obstacles built to impede muscular movement will vanish, defences built to sustain muscular power and protect it will follow suit. In place of these obstacles and defences others will appear, based no longer on the old idea of reducing muscular energy, but of hindering mechanical movement above and beneath. Centres of resistance will then take the place of the present-day belts of trenches. These will no doubt be defended by permanent moats, mine fields and gas inundations. For friendly fleets of landships these centres will become fortified land ports in which they may seek refuge, revictual and refit. They will also become pivots of manœuvre round and between which naval strategy and tactics will be applied to land operations. Surprise attacks will be made on them; they will be blockaded by hostile fleets and relieved by friendly ones, and battles will then be won or lost on land as they are now at sea.

Watchful on the frontiers, for wars will no longer be declared, but like a tropical tornado there will be but a darkening of the sky and then the flood. To dally over the declaration will be considered as foolish as a Fontenoy courtesy—a wave of a plumed hat: "Gentlemen of France, fire first." In the battle of scientific engines the first shot may well prove the last shot, so that directly a cloud appears in the sky of peace the frontier guard will become more and more alert and as the storm approaches the reservoirs will be emptied and hundreds of square miles will be inundated with gas, an impenetrable wall of death being raised in an instant, to which the wall of China now appears but as ripples of sand. Behind this shelter will the Army mobilize, and, being independent of rail or road, it will be in action in a few hours.

Such may a battle be like in 1940; ten years later the landship may have so far approximated to the seaship as to bring this island of ours into ever-increasing peril of invasion, and ten years later still both landship and seaship may so far have approximated to airship that we shall have one arm and not three arms. This is imagination, but imagination based on sound reason, not fantasy—an ideal which,

however, can only materialize and take form if we clench our teeth to the past, sacrifice interest and prejudice, cease tapping the bottoms of our chairs through fear that the new idea is melting the ancient glue, and possess the pluck and determination to play the game and conquer in three words—"energy of action."

PART III.—ENERGY.

8.—The Premises of the New Model Army.

Energy means action, and as action misdirected is uneconomical, let us, therefore, make perfectly certain of the premises upon which any suggestions as to the remodelling of the pre-war or existing armies may be based.

The Great War of 1914-1918, as already noted, opened a new epoch in military history by rendering necessary a scientifically equipped army, the two leading inventions being gas and tanks.

This war has shown:—

(i) That large conscript armies, based on hand weapons, have two fundamental defects: extreme vulnerability due to superficial area, and extreme immobility due to bulk, the necessity of seeking underground protection, and of being tied to road and rail for supply.

(ii) That the petrol engine has not only reduced the human target by enabling few men to do what many were required for, and by enabling above ground and mobile protection against projectiles to be introduced (with the result that wastage of man-power is reduced), but that roads may be dispensed with and mobility of manœuvre and supply increased.

The fundamental fact to be deduced from these premises is that mobility" (carrying with it offensive and defensive power) and not 'numbers," is the line of economic direction along which future preparation—that is, the remodelling of the Army—should proceed.

9.—The Objective, Requirements, and Means of the New Model Army.

The strategical object of the military forces of the Empire is to secure its commercial prosperity and political stability, consequently the Army must not be looked upon as a means of limiting the ravages of war, but as an instrument which *will prevent* war occurring.

Based on this object, the remodelling of the existing forces should produce, within the limits of the money available, a military organization of the highest efficiency and with powers of efficient development along the economic line. Under existing conditions the requirements of the Army, in order of precedence, are:—

(*a*) The maintenance of the integrity of the Empire from external policy and war and the maintenance of internal order.

(*b*) The power of producing, in a scientific war, the most potent weapon of destruction, within the limits of size, that it is possible to create.

The means at present at our disposal are:—

(i) The old Regular Armies—British and Indian.
(ii) The Territorial Force and Special Reserve.
(iii) The new war units—Machine Gun Corps, Tank Corps, etc.

The whole forms a conglomerate and incoherent mass, not only of separate arms, but also of similar arms in various categories of efficiency. Our present Army is a monster carrying with it all kinds of rudimentary organs and ever sprouting new horns.

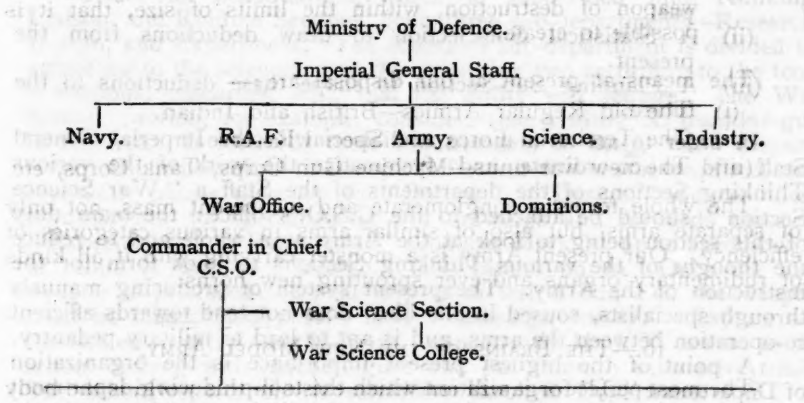
10.—The Brains of the New Model Army.

The most perfect organization which exists in this world is the body of man, at the summit of which is to be found a directing organ—the brains, securely ensconced in a bone box and kept warm by a mat of hair. In an army this organ is represented by the commander and his staff. Our General Staff Officers, before the Great War, worked, but did not think scientifically. They were slaves to the past, in place of being masters of the future. Had the General Staff in 1913 been furnished with a brain they would not have argued for a whole year about the trajectory of a rifle and failed to equip infantry battalions with more than two machine-guns. Had they throught deeply on the most important problem in war, "how to give blows without receiving them," we should have had tanks twenty or more years ago. Had they even been liberal in judgment and open-minded they would not have paid so little consideration to so many of the new inventions the war eventually proved essential. The General Staff were and, in many respects, still are monastic in mind. They accept dogmas which bear but an antiquated relationship to truth and repeat rituals which belong to a dead epoch. They do so not because they lack ability and brain power, far from it, but because their ability and brain power are swamped by routine.

As it is useless to ask a monastery to reform itself, the only practical method of initiating reform is to create outside the monasteries —Army, Navy, and Air Force—a thinking "Imperial General Staff" composed of soldiers, sailors, and airmen; in fact, to institute a "Ministry of Defence," and to degrade the War Office, Admiralty, and H.Q. Royal Air Force from the position of three independent masters to that of three hard-working servants, living in one house and receiving orders from one master—the head of the Ministry.

Considering the Army alone and accepting the Imperial General Staff as the brains of the Defence Forces of the Empire, it becomes necessary to replace the amorphous Army Council by a Commander-in-Chief with a C.S.O. and *one* Staff under him, the main departments being those set forth in Table 2.

TABLE 2.[1]



Dept. A.	Dept. B.	Dept. C.	Dept. D.	Dept. E.
Men.	*Material.*	*Weapons.*	*Movement.*	*Operations.*
(i) Recruiting.	(i) Housing.	(i) Research.	(i) Road.	Intelligence.
(ii) Moral.	(ii) Food.	(ii) Design.	(ii) Rail.	Policy.
(iii) Discipline.	(iii) Clothing.	(iii) Experiment	(iii) Cross Country.	Organization.
(iv) Health.	(iv) Ammunition.	(iv) Production	(iv) Water.	Training.
(v) Mobilization.	(v) Lands.	(v) Repairs.	(v) Repairs.	

Each department of this Staff should be organized in three divisions:—

(*a*) A Thinking Section.
(*b*) A Liaison Section.
(*c*) A Routine Section.

The Thinking Section should form the brains of its department, and, working on the orders of the Imperial General Staff, should apply the policy (principles) received according to existing circumstances (conditions). The Liaison Section (senses) should watch the application of this policy, criticize the work of the Army (muscles), and keep the Thinking Section alive to local and changing conditions. The Routine Section (nerves and system of circulation) should deal with all matters of routine, clear the whole department of waste products, and constitute the channel of correspondence.

In order that logical thinking may be obtained, the Thinking Section should be organized in three sub-sections:—

[1] An important department was omitted from this Table when submitting this Essay, viz.: "Finance," which should be shown as Dept. F. It should come directly under the Staff and be organized in three main sub-departments—Costing, Auditing, Accounting.

(i) An Historical Sub-Section to draw deductions from the past.

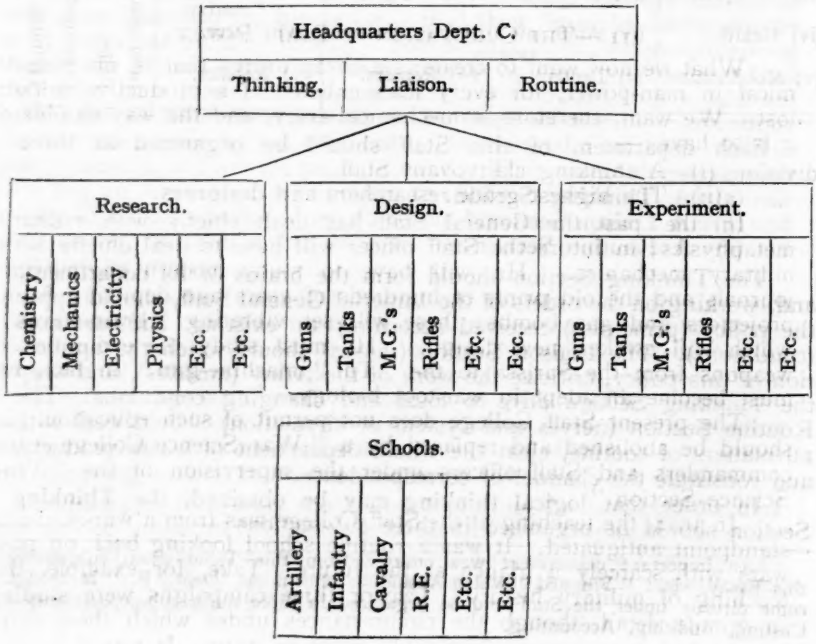
(ii) A Statistical Sub-Section to draw deductions from the present.

(iii) A Planning Sub-Section to shape these deductions to the future.

In order to act as a means of liaison with the Imperial General Staff and to co-ordinate and systematize the work of the various Thinking Sections of the departments of the Staff a "War Science Section" should be attached to the C.S.O.'s office: the main duty of this section being to look at the Army as a whole and to reduce the thought of the various Thinking Sections to book form for the instruction of the Army. The present system of producing manuals through specialists, soused in one idea, does not tend towards efficient co-operation between the arms, and is apt to lead to military pedantry.

A point of the highest present importance is the organization of Department "C," for it will constitute the tool-producing department of the New Model Army. Its personnel will have to be a mixture of civilians and soldiers, and it will have to work in the very closest liaison with the civil sciences. Besides the general organization laid down above, its creative duties should be subdivided as shown in Table 3, and its functions should approximately be as follows:—

TABLE 3.



Under its headquarters, which is subdivided into Thinking, Liaison, and Routine Sections, come three sub-departments—Research, Design, and Experiment. The Research sub-department is divided up according to the sciences, and the remaining two according to the tools —weapons, machines, etc., that the Army will require. The War Science Section, for example, considers that a Mark X. machine-gun is required. It forwards these requirements to H.Q. "C" Department, which consults "Research" if research work be required, and eventually passes them on to "Design." "Design" reduces these requirements to specifications and drawings and forwards these to "Experiment." "Experiment" produces Mark X. up to specification or refers it back to "Design" if it cannot do so. Once the new weapon is produced the next step is to test it out, i.e., the weapon must be made "fool-proof" and "campaign-worthy." Experts are too skilled to carry out this work, consequently Mark X. is sent to the school dealing with machine-guns and put through exhaustive trials. The school reports on its suitability through Department "E" to the "War Science Section," which accepts Mark X. or refers it to Department "C" for improvement or alteration.

By this process the weapon is attuned to the limitations of the private soldier, and all weapons originating from one brain—the "War Science Section"—are co-ordinated, and the specialist, whose efforts have so frequently led to inventions going off at "half cock," is kept within bounds.

II.—The Cultivation of Brain Power.

What we now want to create is a cheap army—that is, one economical in man-power, for every man enlisted is a productive worker lost. We want, therefore, a mechanical army, and the way to obtain it is to have:—

(i) A thinking clairvoyant Staff.
(ii) The highest grade researchers and designers.

In the past the General Staff has dealt chiefly with military metaphysics; in future the Staff officer will have to deal chiefly with military mechanics. He will have to study modern engineering journals and the old prints of hundreds of years ago depicting flame projectors and gas bombs; these will set vibrating "brain-waves" which will awaken new design. He must study the evolution of weapons from the Sarissa to the "Tuf" machine-gun. In fact, he must become an adept in war-tool biology.

The present Staff College does not permit of such education. It should be abolished and replaced by a "War Science College" for commanders and Staff officers under the supervision of the "War Science Section."

In 1914, the teaching at the Staff College was from a war-scientific standpoint antiquated. It was a routine school looking back on past wars with scarcely a glance at the future. Take, for example, the teaching of military history. Two or three campaigns were studied in minute detail, though the circumstances under which these campaigns had been won or lost could never re-occur. It was a routine

study of war. Instead, the whole course of warfare from Xenophon to present time should have been studied, and the application of the principles of war and the evolution of tactics, according to the evolution of weapons, extracted and applied to the design of a possible future.

The one great thing to visualize to-day is that the epoch of all former wars, an epoch based on muscular force, is rapidly closing down, and that a new epoch based on mechanical energy is rapidly opening up. Consequently, the Army of 1914, in a few years' time, will be as obsolete as the Army of 1814, and far more expensive. Unless we have commanders and a Staff who can grasp this and all that it portends, we, fifty years hence, shall be fighting battles with an army of three-deckers in place of an army of battle-cruisers. Meanwhile, the commercial loss will be appalling, and our political stability the weathercock of every international breeze.

12.—The New Testament of the New Model Army.

Look back at our pre-war training manuals—they form a veritable "tangle" of valuable information; how incoherent, how wanting in logical reference or simplicity of relationship. To amend them is to "botch a patch," to rewrite them is to "scrap the lot." Why not, then, take the latter course, for to-day we are in the happy position of being able to do so? We can now rewrite them in relationship to each other and in logical sequence from abstract theory to detailed practice.

As our basis we must think in terms of men and not of weapons, for it is men who read books and not guns and rifles; men, being living beings, require "live" books, not compendiums of uncompromising dullness and polished platitudes.

For our purpose these readers may be divided into the following categories:—

(i) Commanders, (ii) Leaders, (iii) Led, (iv) Administrators; the New Testament of Military Knowledge following suit.

(i) *Books for Commanders.*—A manual on "The Science of War" deduced from an analytic study of the history of war. A manual on "The Science of Military Training" deduced from the principles laid down in "The Science of War."

(ii) *Books for Leaders.*—Manuals on "Combined Tactics" and "Combined Training" based on the principles and conditions of the two former works. These books should be illustrated by numerous historical examples.

(iii) *Books for the Led.*—On the general knowledge contained in "Combined Tactics" and "Combined Training," specialized works known as "Battle and Training Manuals" should be written for each arm.

(iv) *Book for the Staff.*—On all the above works should be produced a "Staff Manual" showing how Staff work cements the whole together. This book should include all Staff duties from those of an adjutant upwards.

The above list is not formidable, but once again it is "quality" and not "quantity" which counts—quality set forth logically and humanly, for man will not read dull books when instead he can read "live" newspapers.

13.—The Influence of Tanks on Existing Arms.

Throughout this section let us constantly bear in mind the postulate of efficient co-operation, namely, "that specialist corps, such as machine-gun, tank, or infantry, do not tend towards efficient co-operation."

The more the parts the more complex the machinery; therefore, let us consider how we can reduce the various arms to that common denominator, the tank, which, more than any other arm, combines offensive and defensive power with mobility, and so best carries out the main problem of battle—"the giving of blows without receiving them."

(i) *Infantry.* — Tanks, by reducing the resistance offered to infantry in battle, enable a smaller body of unarmoured men to accomplish a given operation more quickly and less dangerously than would be possible for a larger body of men unaccompanied by these machines. Tanks, therefore, can replace infantry.

(ii) *Machine Gunners.*—As the tank is the machine-gun destroyer, so equally is it the machine-gun protector, not only protecting the machine-gunners by fire from interference by hostile tanks, but by its mobility from hostile sharpshooters and machine-guns.

(iii) *Artillery.*—The tank of the immediate future is not likely to be placeable in the same weapon category as gun or howitzer, which, being long-range weapons, require little armour or else armour of great thickness. The tank, as at present designed, cannot replace artillery in fire effect, but, by reducing the resistance offered by the enemy to the infantry, it can reduce the necessity for long artillery bombardments. Further than this, if artillery abandon horse traction and adopt cross-country mechanical traction, the guns will virtually become big-gunned tanks.

(iv) *Cavalry.*—As both cavalry and tanks are conjointly short-range and mobile weapons, tanks can replace cavalry in high proportion, and in a scientific war it would be economical to replace the horsemen entirely by fast-moving machines.

(v) *Royal Engineers.*—If it be accepted that the tank renders warfare more mobile, and consequently less entrenched and less dependent on fixed lines of communication, a considerable reduction in field engineers will be possible, their place being taken by those possessing mechanical skill.

(vi) *Royal Air Force.*—To separate the aeroplane from the land arms is to infringe the postulate of co-operation, and, as infantry and cavalry will have to depend on the tank for

protection, and the artillery on the aeroplane for observation, so will the tank have to look upon the aeroplane as its shield and eyes. As the aeroplane is not a land weapon, it is not proposed to discuss it further than to note that its present separation from the Army is a bewildering anachronism in a scientifically constituted force—as well create a separate corps of water carts because they do not carry bread.

(vii) *Gas Services.*—As already pointed out, not only is an air-proof tank the best small box respirator yet conceived, but cross-country mechanical traction is the *sine quâ non* of efficient gas warfare.

(viii) *Supply Services.* — Napoleon once stated that an army marches on its stomach, and it may now be added that in future it will march at the double if its stomach be provided with tracks, that is, if lorries can not only proceed along roads, but move across country. When this is accomplished the supply system of every unit down to a Lewis gun limber can be placed on a mechanical footing.

Summary.—Thus we see that the tank can replace infantry and cavalry, can supplement artillery, can reduce the present numbers of field engineers, and can accentuate the value of machine-gunners, and that the cross-country tractor can practically abolish the horse—the weakest joint in the harness of a modern army.

14.—The Evolution of the New Model Army.

Every new organization requires a period of gestation before it is born. It is considered that it will take approximately five years to form the units for the New Model Army and another five years before vested prejudices and vested interests can be brought to assimilate the new conditions of organization. During the first of these periods it is thought that the 1914 organization should at first be adopted so far as it affects 1914 weapons, and that special corps of the new arms, such as tanks, machine-guns, etc., which will eventually have to be amalgamated in the New Model Army, should be raised, reductions in the old "muscular" arms being effected as mechanical ones become available to replace them. Meanwhile a new model infantry battalion or brigade (see below for organization) should be formed as an experimental unit in order to test out the system and eliminate any minor difficulties discovered in the new organization.

Primary Evolution.—The first steps in the evolution of the New Model Army should be taken along the line of reducing the cost and increasing the efficiency of the administrative and supply services. This problem is too large a one to enter upon here, but it is thought that a great number of horsed vehicles could be replaced by a small number of cross-country tractors. Thus, for example, if there are four brigades of artillery in a division these will require:—

(i) 144 battery wagons.
(ii) 72 limbered and 30 G.S. wagons in the D.A.C.

By cutting the battery wagons down to 72, abolishing the artillery wagons in the D.A.C., and adding 42 five-ton cross-country tractors, a saving of 132 vehicles could be effected and a greater number of rounds carried than at present.

Secondary Evolution.—The secondary evolution covers the period of adolescence. The supply system having been mechanicalized, the next step is to mechanicalize the fighting services; this cannot be done in one mouthful. During this stage the postulate of co-operation must be rigorously enforced, and, in order to start from a known basis, it is proposed to work out, as follows, a new model division on the lines of the existing one:—

(i) *Infantry.*—Twelve battalions, each battalion consisting of four companies, viz., two companies of pioneer riflemen, preferably armed with automatic rifles, one company of sixteen tanks, and one company of machine-guns. Such an organization will effect the destruction of the specialist and introduce a close co-operation between all short-range missile weapons.

(ii) *Artillery.*—Four brigades of field guns and at least two batteries of cross-country tractor-drawn artillery—60-pounders and 6-inch howitzers.

(iii) *Cavalry.*—Two regiments of cavalry and one battery of Royal Horse Artillery.

(iv) *Tanks.*—An independent force of one battalion of tanks to be used as mechanical cavalry.

(v) *Gas Services.*—One gas services battalion equipped with forty-eight gas container tanks or cross-country tractors.

(vi) *Engineers.*—One field company, Royal Engineers; 2 signal companies, Royal Engineers; one tank bridging battalion; and one mechanical workshop battalion.

Such a division as this, it is considered, is, in fighting value, equivalent to:—

(*a*) In a scientific war—at least four present-day divisions, possibly many more.

(*b*) In a colonial war—almost any number of present-day divisions.

Tertiary Evolution.—The full manhood of the New Model Army it is not intended to discuss here, so great will the advancement in mechanics be by the time it arrives. As a mere speculation it may, however, be surmised that all muscle-moving soldiers, horse and foot, will become but mere camp followers, and that three main types of machines will evolve: the fast destroyer—mechanical infantry; the fast battle cruiser—mechanical cavalry; and the heavy-gunned battleship—mechanical artillery.

15.—Garrisoning the Empire.

Accepting the secondary evolution as our model and the garrison of India as our unit of calculation, the following is a rough estimate of the preparations which will have to be made in order to safeguard the Empire.

In 1913 the garrisons of India comprised 76,000 British troops, 160,000 Indian troops (less reserves), 39,000 volunteers, and 21.000 Imperial Service troops. Let us see how we can reduce this prodigious mass of muscle.

Granted that a machine can be constructed with a speed of twenty miles an hour along roads and across country,[1] a machine which has a radius of action of 400 miles and a mechanical endurance of at least 2,000 miles, let us divide India up into mechanical police areas so organized that any part of these areas can be reached by road or across country within forty-eight hours of an emergency arising. This may be taken as the maximum police requirements, it is in reality far more than the maximum.

As the machine visualized has a radius of action of 400 miles and an average speed of ten miles an hour, no part of each police area should be distant more than 200 miles from a police force. This means a twenty-hours' run (double this for rests, etc.) and a consumption of half the total petrol carried, the other half being kept in hand to take the machine home again.

India consists of 1,800,000 square miles of land, of which about 400,000 square miles are uninhabited mountain and desert country. Deduct this and divide the remaining 1,400,000 square miles into squares of 250 miles sides, and the quotient is 22. At each corner place a mechanical police force of 750 men, and the total number of men will aggregate 16,500 all ranks, or approximately one new model division. Add another division so that an independent striking force may exist, and the total number of British troops required is 33,000, not 76,000, and the 220,000 Indian troops, except for a few thousand camp sutlers, may be abolished.

Mesopotamia, Egypt, the Soudan, and Palestine would probably require not more than five new model brigades, and the minor Imperial outposts detachments of one brigade. The total garrison required outside the United Kingdom will, therefore, be four new model divisions, in all 66,000 officers and men.

The garrisoning of the Dominions scarcely lies within the scope of this paper, but it is not considered improbable that:—

(i) Canada could raise six new model brigades.
(ii) Australia could raise four new model brigades.
(iii) South Africa could raise one new model brigade.
(iv) New Zealand could raise one new model brigade.

In all twelve brigades, or the equivalent of at least sixteen present-day divisions.

The garrisons of the United Kingdom would consist of four new model divisions furnishing a relief for those overseas. The Territorial Force should be abolished, for there is no place for it, as at present constituted, in either colonial or scientific wars; its place should be taken by a corps of camp followers—clerks, cooks, mess waiters, etc.—and a special reserve of engineers, wireless operators, postal officials, and other specialists.

[1] Since this essay was written, Mr. Churchill, Secretary of State for War, has informed the House of Commons that such a machine has been built.

Table 4 shows the major, but by no means the total, economies effected by the new model organization.

With an addition of eight battalions of tanks and eight gas service battalions the following savings can be effected: 15 regiments of cavalry, 17 batteries of Royal Horse Artillery, 35 batteries of Royal Field Artillery, 6 companies of Royal Engineers, and 62 battalions of infantry.

It is fully realized that the Army comprises other units besides the above, but it is considered that the economy effected by the reduction of reserves, the abolition of the Indian Army and the Territorial Force, etc., would fully compensate for these, and that the accretion

TABLE 4.

Service.	Pre-War Army, 1914.	New Model Army. (2nd Stage.)
Cavalry.	31 Regiments.	16 Regiments.
R.H.A.	25 Batteries.	8 Batteries.
R.F.A.	147 Batteries.	112 Batteries.
R.E.	86 Companies.	80 Companies.
Infantry.	158 Battalions.	96 Battalions (1).
Tanks (Independent).		8 Battalions.
Gas Service.		8 Battalions.

[1] These battalions it should be remembered include 96 companies of Tanks and 96 companies of Machine Guns.

of wealth to the nation as a whole by adding yearly to industry at least 100,000 Englishmen and 200,000 Indians would in itself pay for approximately half of the year's upkeep of the New Model Army, which, for the whole Empire, would be equivalent in fighting power to at least forty-eight present-day divisions.

16.—THE TRAINING OF THE NEW MODEL ARMY.

"The training of our old Regular pre-war Army was magnificent. It proved its worth to the full, for not only did the officers and men, trained in this Army, halt the Germans at Ypres in 1914, but it was they who trained the new armies which ultimately assisted so materially in winning the war."

This is perfectly true, but do not let us rest on our oars; do not let us suppose that our pre-war training was perfect; rather let us suppose it to have been defective. This at least will provide us with an incentive towards improvement. Our pre-war training was undoubtedly good, but it was somewhat unscientific[1]; it was not too much "individual" but too little "collective," the various arms knowing little of each other's tactics. Our schools individually were good, but they were not co-ordinated. Further, they were purely a peace army organization, and their establishments did not permit of their

[1] Vocational psychology and motion study were practically unknown.

meeting the requirements of war. Further than this, let it well be remembered that as training is founded on tactics, its one purpose is to prepare the soldier to fight. Consequently, as tactics change, training, to be economic, must follow suit, and not only have tactics changed during the last four years, but the whole moral outlook of the nation has passed through a process of development. Consequently, there will also have to be a change in our old discipline in order to bring the new Army in line with national progress.

Before the Great War, the Army was virtually a great national workhouse and conscription was by starvation. The unemployed congregated in it; they came to it destitute of means or of civil craft; they were well fed, clothed, and housed; and then, after a period of happy years, more helpless even than when they enlisted, were they discharged back into civil life craftless, once again, to swell the ranks of the unemployed.

Such a system was not only heartless but unremunerative. The workhouse must go and the university replace it—a people's university which will not only produce skilled soldiers, but skilled workmen. Training, consequently, must be divided under two main headings, "Military" and "Civil," and directly the soldier has become sufficiently proficient to take his place in the ranks must his civil training begin.

On the military side training should be sub-divided under four main headings: physical training, moral training, technical training, and tactical training, and, on the civil side, all the main trades should be taught, for it is useless to cultivate a man's brains unless simultaneously he is given power to use his hands.

Now that mechanical warfare is fast evolving this civil training will become simpler and, consequently, easier to amalgamate in the Army organization. The Army should become the great engineering college of the nation, and every barrack should have its workshops attached to it—workshops which will train soldiers to become useful citizens and which will render the Army self-supporting, at least in part, during peace-time, and which will produce the nuclei for its factories during war.

As the New Model Army will be small when compared with even our pre-war Army, these changes will not require an enormous initial outlay, and the dividend, in terms of military efficiency and commercial prosperity, accruing will soon balance out the initial expense.

As regards training areas, the New Model Army, being a mobile organization, will require a few large tracts of country and not a number of small ones. Nelson had a saying that "the fleet's battleground should be its training ground." Indirectly on land this can be accomplished by large training areas, but seldom by small ones. There should be four great training centres, each sufficiently large to accommodate one new model division—a fleet, so that every part of the division can exchange ideas as well as mimic battles. One should be in open country, one in hilly, one in wooded, and one by the sea coast, so that all types of warfare may be practised.

School instruction should be divided under the three fundamental headings of—men, movement, and weapons.

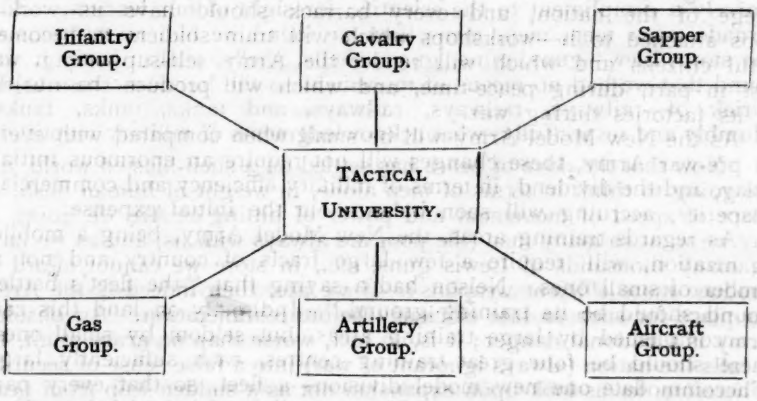
(i) *Men Schools.*—Sandhurst and Woolwich should be abolished. Was there ever such an anachronism as that of dividing up boys into categories of soldiers before even teaching them what a soldier is? A boy has a plastic brain, and the first thing to do is to get him to feel that he belongs to the Army not to a corps, that he is a soldier and not an infantryman or a gunner. Sandhurst and Woolwich should be replaced by one "Military Cadet School," in which training is "soldiership," and not specialization in gunnery, musketry, or the sabre.

Three other schools should be established, a "Leader's School of Psychology," a "Led's School of Physical Training," and the Commanders and Staff Officers' "War Science College," as already explained.

(ii) *Movement Schools.*—For movement a "Mechanical Science School" will be required. This school should be divided into an elementary and an advanced division; the former for the instruction of all arms and the latter for the education and training of the Corps of Mechanical Engineers, a corps the existence of which is even now becoming imperative.

(iii) *Weapon Schools.*—In the New Model Army (second stage) the main arms are infantry (including tanks, machine-guns, light mortars, grenades), cavalry, sappers, gas, artillery, and aircraft (the last-mentioned arm cannot be excluded). For each of these arms a group of schools should exist, and diagrammatically in the centre of these groups (see Table 5) should be established a "Tactical University."

TABLE 5.



Each arm should be instructed in its respective group, and all commanders, superior leaders, superior instructors, and Staff officers should pass through the "Tactical University" and be taught what is meant by the co-operation of all arms. This is scientific training.

17.—The Paying of the New Model Army.

High finance is a science and part of this science is the pay of the soldier, which, in the existing army organization, is based on a fundamental error—namely, one pay for the fighting man and a variety of pays for the tradesman, the non-fighter, the man in the office or shop receiving a higher rate of pay than his comrade in the field or trench! Such a system is an insult to courage; why then does it exist? Because the existing Army cannot produce its own tradesmen. The military tradesman's pay is, therefore, placed sufficiently high to lure his civil brother away from the remunerative civil workshop into the unremunerative military one. Such a system of uneconomically spending the national wealth it would be hard to rival.

In the New Model Army all ranks, fighters and non-fighters, should receive a flat rate of pay, the only exceptions being those specialists, such as skilled craftsmen, whom it would be uneconomical to train in the Army on account of the length of time of apprenticeship. This class would be small, as the Great War has exploded the mystery of the "skilled" workman. In France many skilled workmen were produced from Chinese coolies after a few months' training—this speaks for itself. For a motor cyclist to draw a higher rate of pay than a cavalry man and a riveter more than a fully-trained machine gunner is carrying finance where Alice went—through the looking glass.

18.—Powers of Expansion in the New Model Army.

Every scientifically organized army must possess the power of expansion in war. Before the Great War expansion did not concern us; then, when the storm broke, it swept over us like a tornado, which was scarcely a compliment to the scientific foresight of our leaders. The tornado was: men, men, men; then we found we had no weapons so the storm blew—guns, guns, guns; shells, shells, shells; lastly it was found that we had no means of movement so the hurricane rose to the shriek of—railways, railways, railways, and tanks, tanks, tanks! Humbly and respectfully, what acknowledgments of military ineptitude.

Now that the dove of peace has settled on a shell-blasted world, are we going to think in terms of men alone, in weight of human flesh, in place of speed of movement and power of hitting? Are we going to say we want so many men (the poor are always with us) and as we have so many thousands of Lewis guns, etc., in store we cannot afford to produce more efficient weapons? If we are, then indeed is the Army no place for such as rate efficiency before remuneration. An obsolete army is a national danger; it is, in fact, worse than no army at all, for it lulls the nation (always ignorant of war) into a false sense of security. Therefore, let us look upon expansion not as a sudden leap from peace to war, but as a gradual evolution towards perfection—remember the machine gun and Waterloo.

The most effective and economical means of carrying out expansion, in a scientifically organized army, consists, not in creating a second line

army such as the Territorial Force, that is a "human stop butt," but by increasing the destructive power of weapons and the replacement of these weapons by others of a more deadly nature. Expansion of fighting power, therefore, should be sought along the line of research and design of new weapons and increased movement rather than that of the addition of ill-trained units.[1]

Expansion can also be assisted in three other ways:—

(1) *National Registration.*—The whole of the civil population should be registered for war, so that when war breaks out a man who knows eleven languages is not sent to St. Nazaire as an R.T.O. and a professor of English history turned into a sanitary fatigue man. Each main class should have its mobilization centre.

(2) *Standardization of Factories.*—All factories should, within the limits of peace economy, be standardized for war, so that when war breaks out they can easily be changed from a peace footing to a war footing; the same process should also be applied to means of motion by road, rail, sea and river.

(3) *Standardization of Training.*—Training is the military peace factory for war. Training should, therefore, be easily changeable into operating; consequently the present process of condemning an infantryman to seven years' rifle and Lewis gun training is uneconomical, it deadens the brain and does not produce a reserve adaptable to reinforce the other short range arms. In a new model battalion, if seven years' service be adhered to, training might be carried out normally as follows:

TABLE 6.

Service.	Military Training.		Civil Training.	
1st year	75%	Discipline and Drill.	25%	Education.
2nd ,,	75%	Pioneer work and rifle.	25%	,,
3rd ,,	66%	Pioneer work and M.G.	33%	Trade.
4th ,,	66%	M.G. and Tank.	33%	,,
5th ,,	50%	Tank	50%	,,
6th ,,	50%	,,	50%	,,
7th ,,	33%	Refresher all arms	66%	,,
	50 mths.		34 mths.	

This division of work would automatically make all infantry reserves interchangeable and incidentally fit them for remunerative civil employment on leaving the Army.

[1] At the British Association meeting of 1919 Sir William Pope spoke of the enormous amount of scientific work carried out during the war, and said that the present demands for economy had resulted in the absolute abolition of all that had been done during the last five years. . . . The result, so far as military matters were concerned, was that we should find ourselves in the exact position we were in five years ago.

19.—Constructive Economics.

"'Economy is the soul of efficiency.' Yes, economy is the secret of victory. Why? Because the little you have must be the very best." These are the words of Lord Fisher, the creator of the British Navy of 1914, that weapon of war which, in spite of its too cautious use, was the backbone of the Allies' military successes on land. Without economy there is superfluity—the carrying of unnecessary fat.

As long as every ounce of the Army is not pulling its full weight, then will economy not exist. That we can attain a final state of economy is humanly impossible, for the progress of thought demands incessant change. Nevertheless, the closer we keep to the heels of this progress the more likely shall we be to seize the quarry of war when it suddenly starts across our path.

To-day we are submerged under a wave of pseudo economics. We are reducing the tails of our shirts, the eyeholes in our boots and the buttons on our trousers, but we are not altering the body underneath or attempting to give this body the brains of foresight and of imagination and the will of energy.

The "children" leave the Government departments but the "old men" remain, men not old in years but old in thought—thoughts of a past age and a dead epoch, men who dimly glance at science, that sun of all progress, through the smoked spectacles of routine and do not even trouble to wonder why it looks no bigger than a threepenny bit and scarcely as bright.

We must have scientific training and scientific insight if we are to institute true economy. We have not possessed these in the past. Listen to the words of Professor Gray, President of the Section of Mathematical and Physical Sciences, spoken at the meeting of the British Association of 1919: "When the war broke out, nothing had been done to ensure the utilization for scientific operations which war, as carried on by the Germans, involved, of the great number of young well-trained scientific men in this country. The single idea of the mobilizers was to fill the trenches." In other words, to produce a human stop-butt, and the result was a casualty list of 800,000 killed and several millions of wounded.

In the past our soldiers, though the fault was the nation's, never thought of science and never dreamt of its power. What soldier ever realized that a little sulphur and phosphorus smeared on a chip of wood —the household match of 1840—was a world revolution, or that the pointing of a screw altered the whole outlook of practical engineering. Yet still do we continue to pile up our military tinder boxes and our pointless screws.

In 1906, Sir John Fisher, First Sea Lord, wrote:—"Every penny not spent on an efficient fighting ship and on an efficient fighting man is a penny taken away from the day of battle. Every item of expenditure must be tested by this question: Does it directly or indirectly minister to the fighting efficiency of the Fleet and its instant readiness

for war? If not—out with it! . . . I've seen blankets mouldering from decay waiting to be wanted, and mouldering parasites looking after the blankets! There's a paraphernalia of clerks and auditors looking after these and then there's a Board of Works to look after them, and then come their pensions! And you must have houses to house the pension distributors! It's awful! We have got to be ruthless, relentless, and remorseless!—*Out you go!*"

With a few changes in terminology the above paragraph fits, in many respects, the Army of 1919. How many men are we employing not only to wield but to look after obsolete weapons?—Scores of thousands. We know that a rifle cannot face a machine gun, yet we keep the bulk of our men armed with the rifle; we know that a machine-gun, in the open, cannot face a tank, yet we recruit a larger Machine Gun Corps than Tank Corps. We know what the tank accomplished in the Great War, and, if we do not, Table 7 may prove illuminating to those who can read and understand.

Had Napoleon had a company of machine guns at Waterloo he would have won that battle; had we, in 1914, had tanks we should have won this war the same year. If in 19—, or whenever the next war breaks out, we possess a weapon not millions of times superior to the enemy's as the Vickers machine-gun is when compared to the musket of 1815, but, say, 500 per cent. superior, we shall win that war in a fortnight. Had we done so before this war we should probably have saved 600,000 lives and £8,000,000,000 of money. This sum at 5 per cent. represents £400,000,000 a year; a million or two spent yearly on the design of tanks alone, would not, therefore, appear to be either an extravagant or uneconomical investment.

This is scientific preparation for war, the rest is 1 per cent. This is constructive economy—brain power, money's worth and making the most of time. "Energy! Energy! Energy!" This is the battlecry of peace. Energy of brains, energy of muscles, energy of machines—the rest is adipose tissue.

TABLE 7.—TANK ECONOMICS.

Type of Economy.	Conditions.	Field Gun.	M. Gun.	L.T.M.	Fighting Aeroplane.	Male Tank.	Female Tank.
(i) Economy of Men per weapon	Crew	14	6	5	4 (*a*)	8	8
	Weapons	1 18-pdr.	1 M.G.	1 3" Stokes	2 M.G.'s	2 6-pdrs. 4 M.G.'s	6 M.G.'s
	Men per Weapon	14	6	5	2	1.4	1.4

REMARKS.

(*a*) Includes pilot, observer, one fitter, and one rigger.

Type of Economy.	Conditions.	R.F.A. Bde.	M.G. Bn.	L.T.M. Batty.	Wing R.A.F. 4 Fighter Reconnaissance Sqdn.	Tank Bn.
(ii) Economy of Organization	Personnel	784 (*a*)	928	50 (*b*)	900 (approx.)	737 (*c*)
	Equipment	24 guns	64 M.G.'s	8 T.M.'s	76 aeroplanes	48 tanks
	Weapons	24 guns	64 M.G.'s	8 T.M.'s	152 M.G.'s	48 6-pdrs. 240 M.G.'s
	Men per Weapon	32.6	14.5	6.2	5.9	3.07

REMARKS.

(*a*) Does not include B.A.C. or any portion of D.A.C.

(*b*) Requires attached Infantry to carry ammunition.

(*c*) Includes proportion of Brigade M.T. Coy.

Type of Economy.	Conditions.	Divisional Artillery. 2 Arty. Bdes., 1 Army Arty. Bde., 1 Army Bde. Am. Col., 1 Div. Am. Col., 1 Heavy Arty. Batty. with Am. Col.	Tank Corps on basis of 5 Brigades.
(iii) Economy of Maintenance	Personnel	3.703 (*a*)	14.608 (*b*)
	Equipment	72 field guns and 6 60-pdrs.	720 tanks, 120 supply tanks
	Weapons	78 guns	720 6-pdrs., 3,600 M.G.'s
	Men per Weapon	47.6	3.38

REMARKS.

(*a*) Does not include proportion of divisional train, signals, ordnance workshops, mobile vety. section, etc.

(*b*) Includes whole of tank corps, workshops, stores, signals, field coys., gas services, ordnance workshops, schools, field post offices, etc., with all attached personnel.

(iv) Economy in Fighting Man-power	A brigade of 144 tanks has a fire power equivalent to 24 light batteries of 6 guns each and nearly 200 more machine-guns than carried in a division. An Infantry division accompanied by 1 battalion of tanks can attack three times the frontage of a division unaccompanied by tanks. The fighting Infantry in 3 divisions is 21,000 men, of 1 tank battalion 500. The saving in man-power is therefore 13,500 or 63%.

(v) Economy in Infantry Casualties	The Infantry casualties on the first day of the battle of Cambrai (a tank battle) were approximately 1,000 per division engaged; at the battle of the Somme (an Artillery battle) they were 3,000. If 3 divisions without tanks lose 33% of 21,000 Infantry, *i.e.*, 7,000, and 1 division plus 1 battalion of tanks loses 11%, *i.e.*, 830, the saving in killed and wounded is 6,170. Between July and November, 1917, when tanks were used on impossible ground, 258,000 casualties were sustained; between July and November, 1918, when tanks were used on good going, the Germans lost 284,000 prisoners alone.

Type of Economy.	Operation.	Date.	British Casualties.	German Casualties.
(vi) Increase in Enemy's Casualties	Somme	15.9.16	Nil in 1 tank operating	300 prisoners
	Somme	25.9.16	5 Infantry casualties	362 prisoners
	Somme	14.11.16	Nil in 2 tanks operating	400 prisoners
	Cambrai	20.11.17	5,910 in 6 divisions	8,000 prisoners 100 guns
	Cachey	24.5.18	5 tank crew casualties	400 killed and wounded
	Hamel	4.7.18	686 in 1 division and 60 tanks	1,506 prisoners

(vii) Economy in Artillery Personnel	At third battle of Ypres 121,000 Artillery personnel, including attached, were used on a front of 17,000 yards, maximum penetration on 31st July, 1917, was 3,300 yards. At Cambrai the work normally carried out by guns was carried out by 4,100 tank personnel on 13,000 front. Maximum penetration on 20th November, 1918, was 9,500 yards.
(viii) Economy in Cavalry Personnel.	A cavalry division (less Royal Horse Artillery) totals 7,406 officers and men, is sufficient to man and administer 3 brigades of whippet tanks, totalling 540 machines.

Type of Economy.	Chief Arm.	Battle.	Date.	Frontage.	No. of Shells.	Tonnage of Shells.
(ix) Economy in Ammunition.	Infantry	Hooge	25.9.16	3,000 yds.	37,250	1,016
	Artillery	Beaumont Hamel	13.11.16	8,000 ,,	886,733	22,060
	,,	Arras	9.5.17	17,000 ,,	2,007,534	57,000
	,,	Ypres iii.	31.7.17	17,000 ,,	3,107,363	93,463
	Tanks	Cambrai	20.11.17	13,000 ,,	293,149	5,824

REMARKS.

Ammunition includes 1st day and prior to 1st day.

(x) Economy in Manufacturing Man-power.	Reckoning cost of shell at £5, and of tank at £5,000, at Ypres in preliminary bombardment and first day of battle, 3,000,000 shells represent £15,000,000, or 120,000,000 man hours at 2s. 6d. an hour. At Cambrai, 400 tanks were used, costing £2,000,000; 48 were lost, costing £240,000, representing 2,000,000 manufacturing man hours. Net economy 118,000,000 man hours, or of 39,000 men working for 300 days at 10 hours per day at 2s. 6d. an hour. 39,000 men represent strength of 65 tank battalions, at Cambrai there were 9.
(xi) Economy in Transport.	93,000 tons of shells at Ypres represent 23 4,000-ton ship loads; 460 400-ton train loads (England and France), and 31,000 3-ton lorry loads (France). 6,000 tons at Cambrai represent 1½ ship loads, 30 train loads (England and France), and 2,000 lorry loads (France). Saving 86,000 tons shipping; 172,000 tons railway and 87,000 tons lorry. Total saving 345,000 tons. A supply tank carries 800 18-pdr. shells, or the equivalent of 100 pack mules. It also can carry 10 tons of stores, or the equivalent of 400 men at 56 lbs. a head.
(xii) Econony of weight carried by Infantry.	At Cambrai, infantry went into action carrying 72 lbs. One supply tank would enable this weight for a battalion of 650 men to be reduced by 20 lbs. a man.
(xiii) Economy of Labour on Battlefield.	Enormous economy is effected by using tanks in lieu of guns, on account of the less damage done to roads and billets.
(xiv) Economy of Property.	Very little property is destroyed in a tank battle as compared to an artillery battle.
(xv) Economy of Forage and Food.	A cavalry division requires 2,300 tons of forage and food monthly—a brigade of tanks, 270 tons of petrol and food. 400,000 horses and mules require 720,000 tons of forage a year. If half were replaced by petrol tractors over 250,000 tons of shipping would in a war be saved yearly.
(xvi) Economy of Time.	At Cambrai, 9,500 yards penetration was effected from a base of 13,000 yards in 12 hours. At Amiens in a similar time, a penetration of 13,000 yards was effected. At Ypres, from a base of 17,000 yards, it took 3 months to advance 10,000 yards.
(xvii) Economy of Cost of Production.	The cost of projectiles and explosives alone, for 1918, was £329,860,344, and for tanks £9,587,960.

NOTE.—Table 7 generally refers to the period anterior to August 1918, when the tank was in its infancy; should similar economics be worked out for the period 8th August—11th November, 1918, more startling figures still might be obtained.

THE TRADITION OF THE BRITISH NAVY.

By MAJOR A. CORBETT-SMITH, R.F.A., M.A., Oxon., F.R.G.S.

On Wednesday, January 14th, 1920,
ADMIRAL W. F. S. MANN in the Chair.

THE CHAIRMAN: Ladies and Gentlemen. It is our custom to assemble in this theatre to listen to lectures followed by discussions, but on this occasion you are asked to listen to an address by Major Corbett-Smith, who is going to speak to you on the subject of "The Tradition of the British Navy." To those who have not had the pleasure of meeting Major Corbett-Smith I may say that, after serving in France in the early part of the war, he had to return home, where he was given light duties, and, being gifted with the power of speech in a marked degree, he took upon himself to address large audiences in various parts of the country and also our own Forces, mostly impressing upon them what had happened during the war, but more especially the work of the Royal Navy and the Mercantile Marine. As we all know, the Royal Navy was trained for its job and did it, but the work of the Mercantile Marine, of the fishermen, and the various volunteers who went down to the sea in ships, in all sorts of crafts, on patrol and minesweeping, is not so well known. They underwent terrible dangers owing to the unscrupulous mode of warfare carried on by the Germans, and the country will never forget the work they did, because if it had not been properly performed the war might never have been won by us.

LECTURE.

MAJOR CORBETT-SMITH opened his address (which was in effect a dramatic recital of sea stories, grave and gay) with a short prologue. With a sketch of the Tabard Inn, Southwark, in the days of the Canterbury pilgrims, Chaucer's character of the "Shipman" was presented and his characteristics depicted. He was dressed in a loose robe of coarse gabardine; around his neck hung a dagger; he was bronzed and weather beaten by the winds and the sun, and he was a very fine sailorman. He was a man of simple piety, for he was making a pilgrimage to Canterbury to burn a candle or two to his patron saint. He was a man ill-used to land life and the manners of courtiers; he was fond of a glass and fond of a lass; he was a sterling true comrade; he was a man who knew his job from A to Z.

Seven hundred years later the shipman's counterpart was to be found in British seamen of to-day. The same qualities were found repeated, but the ruthlessness of Chaucer's day towards a beaten enemy had changed into the humanity which was now so notable a feature of Navy tradition.

If it was desired to build the bridge of British sea tradition it was necessary to learn the manner of men they were that made that tradition, and also something of their lives in the upholding of it. It was necessary to look back through the vista of the centuries and see how various ships' companies contributed to the making of the tradition; it was necessary to see how the comradeship of the sea, the comradeship of peril, made the man. He lived for months cut off from the society of his fellows on land, constantly facing death at any hour of the day or night, which developed in him a fine devotion and loyalty to his comrades, and an infinite resource and cunning which seemed to have been inherited from his Scandinavian ancestors. He possessed a simple piety, which sometimes developed into a fierce fanaticism, the fanaticism of the Puritans or of the men who fought under Drake—the fanaticism of men who thought themselves to be God's own chosen people. It was necessary also in thinking of the making up of the qualities of the seamen to give a thought to the conditions under which the men did their work—of the awful food and conditions of living in the little ships they occupied; of their arrears of pay, of being at sea sometimes seven years at a stretch without seeing their native land; of the press gang and many other things. With regard to the officers, in addition to the qualities that applied to the seamen, it was necessary to add that amazing "will to do" which so characterized the officers of the Royal Navy. If the men provided the hardihood to carry the job through, it was the officers with the directing brains who possessed that magnificent driving power which got the last ounce out of the men.

The lecturer proceeded to show, by means of examples, that the British Navy comprised four estates, the first of which was the Royal Navy, and the second the Mercantile Marine. The ships that flew the White Ensign were only on the fringe of the real British Navy, because the foundation, the heart and core and centre of it all through the years had been the Mercantile Marine. As an illustration of this, the lecturer mentioned how, 300 years ago, there sailed out from Plymouth Sound a little merchant ship called the "Elizabeth," whose skipper was named John Pascoe, and whose crew were all men from the West Country. Three days out the little "Elizabeth" ran straight into the arms of three Algerine pirates, which, between them, carried fifty guns against the "Elizabeth's" ten. From the early morning till the setting of the sun the pirates tried to capture or sink her; seven times did they board her, and seven times did the men of Devon pitch the pirates back into the sea; and when the sun set one of the pirates had been sunk and the others had turned tail and fled.

Four years ago there sailed through the narrow seas for Queenstown, in Ireland, a little merchant tramp called the "Anglo-California," and the name of her skipper was Parslow. She was within sight of the Irish coast when a submarine came up on the starboard beam and started to shell her. The submarine came so close that the men on her deck could actually use their rifles. All that the men of the "Anglo-California" had with which to return the fire were their naked fists and the splendid skill in seamanship

which Parslow possessed. For hours Parslow, on the bridge, so manœuvred his ship as to offer the smallest target to the submarine; shells raked the little ship from stem to stern, and the men began to go down beneath the hail of lead. One shell, which burst on the bridge, inflicted terrible injuries on the skipper, who was badly wounded in the head, while one arm and one leg were completely severed. As he lay there dying he said to his son with his last breath: "Take the wheel, young 'un, I am done"; and so the gallant spirit passed, and with the passing the tradition of the British Navy was handed on. Young Parslow took the wheel; after five hours' fighting some friendly destroyers came up over the horizon, the submarine slowly sank beneath the waves, and young Parslow took his ship into Queenstown with his Colours flying. Four years ago a little merchant ship! Three hundred years ago a little merchant ship!

It was necessary to go back to history sometimes to enable one to understand the tradition of the British Navy. When Philip of Spain and the Spanish Armada were defeated more than three-quarters of the British ships were merchant ships. Drake, Frobisher, Howard, and Effingham sailed into the uncharted West not on men-of-war but on little cockle shells of merchant ships; and Nelson served his apprenticeship on board a merchant ship. In the great war that has just finished one man in twelve of the merchantmen had been a casualty; and they were the foundation of the Navy in the war, as they had been of the Navy throughout the centuries.

The third estate was composed of the fisherfolk. In Queen Elizabeth's time, away on the Newfoundland banks, there was a fishing fleet called the Queen Elizabeth fishing fleet, the commander of which was a man named Richard Whitbourne. The news came that the Spaniards had fitted out an armada; Whitbourne called his masters and crews together, and, with his own ship in the van, he led the fleet across the Atlantic, and, on arriving at Plymouth Sound, reported to the Admiral that the fishing fleet had come to fight the Spaniards; and after they had done so, and beaten them, Whitbourne led his ships back across the Atlantic.

In 1914 news came to the Newfoundland fishing fleet that the Germans were preparing to attack England. The commodore called his captains and men together, and, with his own ship in the van, he led them across the Atlantic, and, going straight to the 10th Cruiser Squadron, he reported: "Sir, we have come to fight the Germans"; and for five weary years of war the men from Newfoundland, of British stock, kept watch and ward on the Arctic Circle. When that business was finished the commodore led what was left of his fleet back across the Atlantic, and there they are fishing at this very day. That was the tradition not only of the British Navy but of a seafaring race. At the first call of the country the fishing-folk turned out from Kirkwall right round the coast—even the wives and the kiddies—to fight the Hun.

There was a little trawler in the Adriatic one fine day with a crew of five men and a boy, and the name of the ship was the "Gowan

Lea," skipper Joseph Watt. She was clearing up mines. One morning there came an Austrian cruiser, which signalled to Watt to surrender. Watt called up his crew of five men and a boy; they gave three cheers for the King, ran the Jack up to the main, and opened fire with their little popgun on the Austrian cruiser. Whether the Austrian cruiser thought her opponent was a mystery ship he did not know, but she turned tail and fled, and Joseph Watt had the satisfaction of bringing his ship out of action with her Colours flying, and he got the Victoria Cross for it. Joseph Watt was a man who used to bring people their kippers for breakfast before the war!

On another day a little trawler ship of ours was in the Adriatic clearing up Hun spawn in the shape of mines. Something went wrong with the engines, and the boat had to be sent to the base to be overhauled. But the skipper put off in the dinghy with a couple of men and three rifles. When the trawler got back to her base the S.N.O. asked for the skipper. "Skipper?" said the mate; "Oh, he's out in the dinghy blockading the Bulgars." He was just "carrying on." Did those men ever strike for more pay than their miserable 2s. 6d. a day? If the Grand Fleet saved civilization, the mine-sweepers saved the Grand Fleet.

The fourth estate was actually the largest of all, comprising the men and women of our island race who heard the call of the sea. There ran in the veins of everyone in this country something of the centuries-old tradition of the sea. In the golden age of adventure, in the time of the Tudors, there went through this country such a wave of enthusiasm for the sea that it made the world wonder. It was not amongst the dwellers on the coast-line, but among the men from the inland counties, from the industrial districts, in whom the call of the sea rang most clear. Apprentices and assistants at the loom joined in trying to find the Spanish Main. At the end of 1914 there was nothing that surprised naval officers and men more than the curious chaps who rolled up for jobs in His Majesty's ships —"hostility men," as they were called in the Fleet—clerks, road-makers, pawnbrokers, theatre chuckers-out, stablemen, market gardeners, painters, and every class of the community. It was the call of the sea—the tradition of an island race. In the slums of Sheffield, in the drab melancholy of the Potteries, in the cotton-mill districts of Lancashire, or in any industrial district the number of men who joined His Majesty's ships was astonishing, but it was simply history repeating itself over again. And it was not confined to the men; the tradition of the sea applied to the women also, as had been amply proved by the courage and devotion shown by them during the war.

There were many sides also to the tradition. Chaucer's shipman was ruthless towards a beaten enemy, and it was not until the 16th century that humanity found a place in naval traditions. Everyone knew what the humanity of the sailorman was to-day. One of our flotillas of destroyers was in the North Sea straffing Zeppelins, and in the middle of the action one of the destroyers signalled to the commander asking for permission to stop the ship and pick up the

ship's dog which was overboard! One wondered what the crew of the Zeppelin thought about it. As a companion picture: there was a village on the Western Front which had recently been evacuated by the Huns, and five of our men were passing an old ruined church and heard inside the cries of an animal in distress. They followed the sound, and eventually found against the wall a little kitten crucified, with its paws twisted round with strands of barbed wire. One of the men instantly went forward and cut the wires, and immediately the whole party was blown up by a Hun contact bomb. The enemy knew the way in which to trade upon the British tradition of humanity and chivalry. Then there was the tradition of loyalty, cheeriness, and efficiency, scores of examples of which could be given; but as fine an example of efficiency as it was possible to imagine was contained in almost the concluding paragraph of Admiral Jellicoe's despatch on the Battle of Jutland, in which he stated that night had fallen; no more ships were to be seen, and at 1.15 p.m. on June 1st course was shaped for the bases, which were reached on Friday, June 2nd. The fleet was refuelled and refurnished with ammunition and supplies, and at 9.30 p.m. on Friday, June 2nd, she reported ready for further action. That meant that, after the greatest sea-fight in history, notwithstanding the hundreds of miles that had to be steamed, or the bad weather or hard knocks the ships had received, they got back into port, and inside of eight hours were ready to start the whole business over again. As a companion picture the German Fleet was not ready again, even in two and a half years. That was the difference in seamanship and sea tradition.

Another fine characteristic of the sailorman and the soldierman was his marvellous cheeriness and gaiety of spirit, which carried him through many tight places. Edward III. led his men into action to the sound of a good old British folk song. In the middle of an action the laced hat on the figurehead of the "Duke of Brunswick" was knocked off by a chance shot from the enemy, and a solemn deputation from the fo'castle waited upon the captain asking that the figurehead should not go uncovered in the face of the enemy. The captain had the defect remedied, "and the happy deputation scampered off to fight again." The story was told of two stokers, who, in the middle of the Battle of Jutland, put their heads up through a hatchway in order to get a breath of fresh air, and an officer who overheard their conversation heard one stoker say to the other: "What I says is, he ought to have married the girl." That was typical of the spirit of the British sailormen all through history. The officer's life in which the tradition of the Navy was most finely summed up was Admiral Collingwood's, to whose memory a cenotaph had been erected in a church at Newcastle-on-Tyne, which contained as fine a tribute to the British seamen and to the tradition of the British Navy as one could wish. "He held the command of the Mediterranean for nearly five years, during which he never left his ship for a single day, displaying unrivalled professional skill and conducting many difficult and important negotiations with great political sagacity and address. At length, on the decline of his health, he became

anxious to re-visit his native land, but, being informed that his services could ill be spared in those critical times, he replied that his life was his country's, and persevered in the discharge of his arduous duties till, worn out with fatigue, he expired at sea in the 61st year of his age." The tradition of the British Navy was summed up in those words, and it had been splendidly upheld in later years.

Major Corbett-Smith concluded with an inspiriting recital of Newbolt's poem, "Drake's Drum."

On the motion of the Chairman, a hearty vote of thanks was accorded to Major Corbett-Smith for his interesting address, and the meeting terminated.

THE DEVELOPMENT OF SEA WARFARE ON LAND AND ITS INFLUENCE ON FUTURE NAVAL OPERATIONS.

By BREVET COLONEL J. F. C. FULLER, D.S.O.,
Oxfordshire and Buckinghamshire Light Infantry.

On Wednesday, February 11th, 1920, at 3 p.m.

MAJOR-GENERAL SIR J. E. CAPPER, K.C.B., late R.E., in the Chair.

THE CHAIRMAN: Ladies and Gentlemen. Colonel Fuller is kindly going to talk to us this afternoon about the tanks, the latest arm in the land service. There is no man more qualified to speak on the subject than Colonel Fuller, who was G.S.O.I. to the Tank Corps in France, and was very largely responsible for getting out the tactics of the tanks that were used and the improvements that were made from time to time in their use. He was also very largely responsible for the throwing out of the hints on which the training was carried on. No man, therefore, is better fitted to talk on the subject than Colonel Fuller.

LECTURE.

IF, a few years before the recent war, I had appeared before a popular assembly and had delivered to it a lecture on the "Development of Sea Warfare on Land," I feel perfectly certain, with all due respect to the intelligence of my audience, that my discourse would have been classed with those of Maundeville and Munchausen. Yet to-day I feel equally certain that, even if I dip too boldly into the future, what I have got to relate to you about land sea-warfare during the Great War will at least hold your attention.

That this is now possible is worthy of careful thought. If four and a half years of war have so completely turned our conceptions —strategical and tactical—upside down, what of the future, what changes will it bring, what developments, what evolutions?

There is a spirit of unification in the air, a new epoch in warfare is dawning. Science has gripped the fighting services and is shaking them closer and closer together, and we see, even now, bulking large on the horizon before us, one defence force in place of three, with one brain behind it which must understand all the intricacies of its bodily organs, for, without such a brain, economy in war will be impossible.

To-day I want you to think in the very simplest terms, for simplicity alone must be our guiding star.

The fundamental principles of war, whether on land or sea, are identical, and in both spheres of operations many of the conditions of war are the same, but a few are different, and these few change the complexion of the two forces—one looks blue and the other looks red—but the material is very similar, and, like a coat, its colour matters little so long as it covers the body—in the present case the Empire—and protects it from cold, wind, and rain—the storms of war.

Scientifically, war, whether on land or sea, is composed of three elements—movement, weapons, and protection—all originated by or from one substance—man.

You must have men, at least two men, before you can have a fight; they must be able to move and they must be able to hit and to protect themselves from being hit.

The first battle on land was the struggle between two unarmed men, their weapons being their teeth, feet, and hands; so was the first battle at sea; but, whilst earth is man's natural vehicle of movement, water is not so, and water perplexed man's brain; it made him think, and thought produced the first boat—that is, a mechanical means of movement.

During the classical period battleships were equipped with oars, and we find oars remaining the chief means of propulsion as long as battles at sea are fought by boarding. Then gunpowder replaced oars by sails, and naval battles are won by wind and fire. Then came steam and the wind is cancelled. Steam enables armour to be carried, armour increases fire power, until we see to-day colossal floating batteries armed with 18-inch guns. The separation from the soldier on land, with his funny little rifle, is now complete.

What stupendous changes since Nearchus commanded a corps at the battle of the Hydaspes, and a few months later, in charge of a fleet, sailed down the Indus and up the Persian Gulf.

Briefly summarized, naval conditions of fighting, compared to those on land, offer us the following advantages:—

(i) Muscle is replaced by machinery and skin by armour plate.
(ii) Time is economized and military spaces are enlarged.
(iii) Weapons of high and low calibre can be moved with equal ease.
(iv) Weather has less effect on human endurance.
(v) Communication and supply are simplified.
(vi) Speed is increased.
(vii) Command is facilitated.
(viii) Training can be standardized and ability given great scope.

In short, naval conditions are superior to those on land, with the exception of the following:—Cover from view, security from fire and possibility of surprise. Yet, curious to relate, these very superiorities of land warfare are becoming possible at sea since submersible vessels can now seek cover from view and fire and gain surprise—by water, in a very similar manner as cover by ground and surprise is gained on land.

If now a means can be introduced whereby the naval conditions, which are mainly dynamic, can be super-imposed upon the existing land conditions, which are much more static, an entirely new theory of war can be evolved on land which, in its progress, will completely change the whole practice of present-day land warfare. This means already exists in the Tank, or Land Ship, which, though still in an early stage of development, possesses even now many of the characteristics necessary to accomplish such a change.

What is a Tank? A mechanically propelled battery on land!

What is a Battleship? A mechanically propelled battery on water!

The curtain of the future is rent asunder and that oracle, the "internal combustion engine," conjures up before us, dim at first perhaps, but still discernible, battle forms to come which to-day stagger the imagination!

And now for a moment to return to the common-place.

The winds of the past were the roads and railways of the sailing ship, and naval strategy was built on breezes, just as on land strategy has been controlled by fixed communications.

Wind capacity, seventy years ago, was a vital problem at sea, and as late as the Crimean War sailing ships were towed into position opposite Sebastopol by steam tugs, and naval battlefields began to grow windless.

Road capacity to-day is still the vital problem in land strategy, but the tug, in the form of the Tank, has arrived, which is destined, so I feel, to render the earth roadless; and, as ten years after the Crimean War we find every self-respecting fleet propelled by steam, so do I believe that, ten years hence, shall we find every self-respecting army propelled by petrol. Roads will vanish with the winds, and armies, like navies, will become mechanical.

Steam rendered armour possible, and though Alexander, at the siege of Tyre in 332 B.C., clad his triremes in mail, armour on battleships only first appeared in modern times in 1862, when the Confederates built the "Merrimac," and protected her by impromptu armour constructed out of railway irons.

In the same way as Tanks have had their detractors, there was not wanting in those days a number of eminent persons who ridiculed the idea of an armoured ship.

The "Merrimac," however, created, as you remember well, enormous havoc amongst the shipping of the Federals, and the Northerners were compelled to protect their ships in a similar manner before they could fight on equal terms; the result was the "Monitor."

So also will the result of the Tank be the Tank, because it enables—

(i) Skin to be replaced by armour.
(ii) Muscular movement to be replaced by mechanical energy.
(iii) And weapons of low power to be replaced by those of high.

If this is not a well-swung compass which shows us the correct direction towards progress in future warfare, then I must acknowledge myself indeed not a Munchausen but a maniac.

Now I will enter into a little detail.

In modern times the chief considerations for the construction of warships have been—

(i) Steadiness as a gun platform.
(ii) Protection by armour of the vital parts.
(iii) Carriage of guns of sufficient power to penetrate the armour of the enemy's battleships.
(iv) Mounting the guns sufficiently high above the water line to enable them to be fought in a rough sea.
(v) All-round fire.
(vi) Speed to overtake or get away from an enemy.
(vii) Smallness of the target to the enemy's fire.
(viii) Manœuvring power to maintain, as far as possible, any desired position with regard to an enemy, and, by manœuvre, to reduce the danger from the enemy's weapons.
(ix) As large a radius of action as possible.
(x) Proper provision for berthing of officers and crew.

In other words, offensive power, defensive power, mobility, and human comfort; weapons, protection, movement, and men—the four great factors in war.

These are precisely the chief considerations of a mechanical machine required for land warfare, if rough ground be substituted for rough sea.

For the development, therefore, of mechanical warfare on land, lessons may with advantage be drawn from the history of mechanical warfare at sea, and, in this respect, we shall not be far wrong if we follow the broad principles which the evolution of centuries has shown to be of the greatest importance.

The problems to be overcome are not dissimilar; the ship, navigating on sea, must avoid shoals and rocks, while the Tank on land must avoid swamps and streams.

There are also no inherent obstacles which render the development of mechanical warfare on land more difficult than on the sea; the obstacles to be met with are, in fact, easier to overcome, for, whilst there is a real difficulty in designing a ship which will negotiate land obstacles, there are few in designing a Tank which will negotiate water obstacles.

Though such a Tank has never been built, had the soldier, in 1917, known a little more about the elements of navigation, in my humble opinion, he would not have ordered Tanks into the Ypres swamps; it was tantamount to expecting the Grand Fleet to sail the Goodwin Sands.

Then came the Battle of Cambrai; it was the St. Vincent, the Trafalgar of the British Tank Corps. The problem was how to break the line—a thorough naval problem, and, I am proud to say, worked out on naval lines.

The Hindenburg line represented the enemy's fleet. Up to the date of the Battle of Cambrai we had attempted to break this and

other lines by a parallel action of enormous broadsides followed by boarding. Such action failed, and it failed on land through causes for which no parallel exists in sea warfare.

The guns drove back the enemy's line, but in doing so they tore up the ground to such an extent that it became not only most difficult for men on foot to move over it, but impossible for wheeled transport to do so.

If we liken the army of this period to a sailing ship, the gun-fire created a Sargasso Sea—the army was marooned in a swamp of *débris* in place of sea-weed.

At Cambrai the mechanical warfare tactics were very simple:—

(i) Break the line.
(ii) Envelop the fractures.
(iii) Pour broadsides into the enemy.

The internal combustion engine was too much for German muscle. In twelve hours an advance of 10,000 yards was made; at Ypres it took 2,000 hours to accomplish its equivalent by means of gun-fire. At Ypres we lost 10,000 men in casualties before the battle opened, at Cambrai only 5,000 during the first day of the operation. At Ypres we expended 93,000 tons of shells, costing some £18,000,000, during the preliminary bombardments and on the first day of the battle; at Cambrai there were no bombardments and on the first day only 5,824 tons of shells were expended.

The first real naval action on land had proved one of the most astonishing successes in the whole history of warfare. The "Merrimac" had reappeared, a new epoch in war had dawned—the epoch of the soldier-mechanical-engineer.

I will not weary you with the relation of great battles such as those which were waged in 1918, for their details are still bright in your memory, but I will describe to you the action of one Tank—a kind of second "Emden"—to show you what was possible of accomplishment with the first type of British light Tank constructed—the "Whippet" or Medium Mark "A" machine.

On August 8th, 1918, Whippet "Musical Box," under command of Lieutenant Arnold and with a crew of two men—Driver Carney and Gunner Ribbans—proceeded into the battle.

The machine had gone about 2,000 yards when "we came," Lieutenant Arnold writes, "under direct shell-fire from a four-gun field battery, of which I could see the flashes, between Abancourt and Bayonvillers. Two Mark V. Tanks, 150 yards on my right front, were knocked out. I saw clouds of smoke coming out of these machines, and the crews evacuate them. The infantry following the heavy machines were suffering casualties from this battery. I turned half left and ran diagonally across the front of the battery, at a distance of about 600 yards. Both my guns were able to fire on the battery, in spite of which they got off about eight rounds at me without damage, but sufficiently close to be audible inside the cab and I could see the flash of each gun as it fired. By this time I had passed behind a

belt of trees running along a roadside. I ran along this belt until level with the battery, when I turned full right and engaged the battery in rear. On observing our appearance from the belt of trees the gunners, some thirty in number, abandoned their guns and tried to get away. Gunner Ribbans and I accounted for the whole lot."

After a short halt Lieutenant Arnold again advanced, his report reading:—

"I proceeded parallel with the railway embankment in an easterly direction, passing through two cavalry patrols of about twelve men each. The first patrol was receiving casualties from a party of enemy in a field of corn. I dealt with this, killing three or four, the remainder escaping out of sight into the corn. Proceeding further east I saw the second patrol pursuing six enemy. The leading horse was so tired that he was not gaining appreciably on the rearmost Hun. Some of the leading fugitives turned about and fired at the cavalryman, when his sword was stretched out and practically touching the back of the last Hun. Horse and rider were brought down on the left of the road. The remainder of the cavalrymen deployed to the right, coming in close under the railway embankment, where they dismounted and came under fire from the enemy, who had now taken up a position on the railway bridge, and were firing over the parapet, inflicting one or two casualties.

"I ran the machine up until we had a clear view of the bridge, and killed four of the enemy with one long burst, the other two running across the bridge and so down the opposite slope out of sight. On our left I could see, about three-quarters of a mile away, a train on fire being towed by an engine. I proceeded further east still parallel to the railway, and approached carefully a small valley marked on my map as containing Boche hutments. As I entered the valley (between Bayonvillers and Harbonières) at right angles many enemy were visible packing kits and others retiring. On our opening fire on the nearest many others appeared from huts, making for the end of the valley, their object being to get over the embankment and so out of our sight. We accounted for many of these. I cruised round, Ribbans went into one of the huts and returned, and we counted about sixty dead and wounded. There were evidences of shell-fire amongst the huts, but we certainly accounted for most of the casualties counted there. I turned left from the railway and cruised across country, as lines of enemy infantry could be seen retiring. We fired at these many times at ranges of 200 yards to 600 yards. These targets were fleeting owing to the enemy getting down into the corn when fired on. In spite of this many casualties must have been inflicted, as we cruised up and down for at least an hour. I did not see any more of our troops or machines after leaving the cavalry patrols already referred to. During the cruising, being the only machine to get through, we invariably received intense rifle and machine-gun fire."

The Tank was now advancing under difficulty. An extra supply of petrol had been stored on the roof of the fighting cab—an act almost

as foolish as carrying oil fuel on the deck of a battleship. Several tins had been perforated by bullets and the petrol was trickling into the cab. The report continues:—

"At 14.00 hours or thereabouts I again proceeded east, parallel to the railway and about 100 yards north of it. I could see a large aerodrome and also an observation balloon at a height of about 200 feet. I could also see great quantities of motor and horse transport moving in all directions. Over the top of another bridge on my left I could see the cover of a lorry coming in my direction. I moved up out of sight and waited until he topped the bridge, when I shot the driver. The lorry ran into a right hand ditch. The railway had now come out of the cutting in which it had rested all the while, and I could see both sides of it. I could see a long line of men retiring on both sides of the railway and fired at these at ranges of 400 yards to 500 yards, inflicting heavy casualties. I passed through these and also accounted for one horse and the driver of a two-horse canvas-covered wagon on the far side of the railway. We now crossed a small road which crossed the main railway, and came in view of a large horse and wagon lines, which ran across the railway and close to it. Gunner Ribbans (right-hand gun) here had a view of the south side of railway and fired continuously into motor and horse transport moving on three roads (one north and south, one almost parallel to the railway, and one diagonally between these two). I fired many bursts at 600 yards to 800 yards at transport blocking roads on my left, causing great confusion. Rifle and machine-gun fire was not heavy at this time, owing to our sudden appearance, as the roads were all banked up in order to cross the railway. There were about twelve men in the middle aisle of these lines. I fired a long burst at these. Some went down and others got in amongst the wheels and undergrowth. I turned quarter left towards a small copse, where there were more horses and men, about 200 yards away. On the way across we met the most intense rifle and machine-gun fire imaginable from all sides. When at all possible we returned the fire, until the left-hand revolver port cover was shot away. I withdrew the forward gun, locked the mounting, and held the body of the gun against the hole. Petrol was still running down the inside of the back door. Fumes and heat combined were very bad. We were still moving forward and I was shouting to Driver Carney to turn about as it was impossible to continue the action, when two heavy concussions closely followed one another and the cab burst into flames."

Arnold and the two men rolled out of the burning Tank, Carney, the driver, was unfortunately killed immediately afterwards and Lieutenant Arnold and Gunner Ribbans were made prisoners by the enemy.

Such was the action of a Tank of the "Merrimac" class. Luckily for us the German "Monitor" proved a failure.

Though the above incident is an exceptionally dramatic one, I could give you other examples, such as the charge of seven Whippet Tanks at Cachy, on April 24th, 1918, when a whole regiment of German infantry was over-run with a loss of some 400 men; but I

will not multiply these examples for one alone is sufficient to prove the principle that iron and petrol can beat flesh and blood.

There is another side to this mechanical question—supply. Fleets require vast supplies, and so do armies, but the former have the great advantage of being self-contained, that is, ammunition, rations and fuel are carried in the fighting ships, which are, to a great extent, independent of communications as long as their supplies hold out.

An army, compared to a fleet, is a very complicated organization, for the fighters, ammunition columns, and supply columns are all separate parts constantly wearing each other to pieces through friction.

A mechanical army would be freed from many of these inconveniences. There is no reason why a Tank should not be built with a radius of action of 300 or 400 miles and power of manœuvring on its own, free of communications, for at least a week. Such a machine would produce a complete revolution in land strategy.

During the Great War Tanks were short-radius weapons, the heavy Mark V. Tank having a radius of action of only twenty to twenty-five miles and the Whippet of thirty-five to forty. The result was that they had to be supplied by tenders or supply Tanks. Cumbersome as this system was it nevertheless created a minor revolution. Take, for instance, the Mark IV. Supply Tank; this machine could carry ten tons of ammunition or stores; this is the equivalent of a carrying party of 400 men, which, in war, generally means 400 fighting men or over half a battalion. What this alone means in land warfare needs no explanation, and it must not be forgotten that the Tank delivers the goods to the firing line, not to a point one or more miles in rear of it.

Now that I have very briefly shown you how sea warfare developed on land during the last two years of the Great War, I will firstly place before you certain influences the Tank has brought to bear on land strategy and tactics, and secondly ask you to follow me into the future.

Strategy, or the science of making the most of time for warlike ends, that is, of opportunity, will practically cease for that side which pits muscular endurance against mechanical energy.

The possibility of applying naval tactics to land warfare is an entirely new application of the strategical principles of war, which endows the side which can apply them first with an incalculable power. Formerly strategy depended on communications, now communications will become universal, and though roads and rails will not cease to exist, they will become but lines of least resistance to movement in the universal vehicle into which the earth's surface will be turned by all types of cross-country machines.

Strategically the leading characteristic of the Tank is that it is a time-saver. Every principle of war becomes easy of application if movement can be accelerated and accelerated at the expense of the opposite side. To-day to pit an over-land mechanically moving army against one relying on roads, rails, and muscular energy, is to pit

a fleet of modern battleships against one of the wind-driven three-deckers. The result of such an action is not even within the possibilities of doubt; the latter will, for a certainty, be destroyed, for the highest form of machinery must win, because it saves time—the controlling factor in war as in peace.

Grand tactics. How does the Tank affect this branch of the science of war? First of all let me make myself clear to you what I mean by grand tactics. I mean the plan of battle and not the moves which lead up to its execution or the battle itself. This plan falls under four headings:—

(i) Surprise and feints, to multiply striking power.
(ii) Attrition, to reduce the enemy's endurance.
(iii) Envelopment to strike at a weak point.
(iv) Penetration to create a flank to be enveloped.

We have only got to look at the recent war to see what the Tank accomplished.

Before the days of the Tank surprise was almost impossible, attrition most costly, and envelopment and penetration undertakings of the greatest difficulty.

Then, after the Tank had arrived, surprise becomes the foundation of every battle, attrition reduces the enemy and not ourselves, prisoners alone number our own losses; penetration becomes a practical and economic proposition, and with penetration envelopment follows suit.

The war was won on land by the reinstitution of an economic grand tactics, a branch of the science of war which practically ceased between November, 1914, and November, 1917, to be operative.

And now as regards the battle itself; what has the Tank accomplished? (the Tank we had during the war was a machine, remember well, which only had a maximum speed of five miles an hour and a radius of action of not more than twenty-five miles). Let us consider this under the three general headings of defensive power, offensive power, and supply or movement.

Defensive Power.—It has nullified the trench and enabled men to move over the open protected by armour; it has reduced wire to mere sea-weed traversable at will, and consequently it has reduced the necessity for field engineering; but above all it has harmonized movement and security.

Offensive Power.—It has enabled the soldier to conserve his muscular energy for fighting in place of marching. It has multiplied the power of his weapons by enabling him to carry forward great quantities of ammunition. It has reduced the human target and nullified, to a great extent, the exhaustive effects of weather; but above all it has harmonized fire power and movement.

Supply.—It has reduced the enormous expenditure of artillery, ammunition, of road material and of hutting, for Tanks do not require roads neither do they obliterate the forward area as the battle proceeds. It has reduced casualties, consequently the size of hospitals and ambulances. It has facilitated by wireless the supply of information, but

above all it has freed the administrative troops from the shackle of roads.

Compare the above accomplishments to the naval conditions I enumerated at the beginning of this lecture and you will understand why the Tank rightly has been called the Land Ship. It has superimposed naval tactics on land tactics, that is, it has enabled men to discharge their weapons from a moving platform protected by a fixed shield.

Now I will place before you two other reasons why its further evolution is a certainty.

Firstly, because the Tank combines, in a high degree, security, mobility, and offensive power. If the "Merrimac"-Mark V. Tank accomplished the above, what will the "Queen Elizabeth" or "Hood" types accomplish in the future? Remember there is nothing to stop five miles an hour growing to twenty-five and the twenty-five miles radius of action to 250 or 500 except lack of money to pay for the best brains.

Secondly, another great revolution in warfare faces us both on land and sea—gas warfare. Do not let us minimize its possibilities. Five hundred years ago both soldier and civilian scoffed at gunpowder and declared it to be a devilish invention because it happened to be a new one. Everything new has in its time been attributed to his Satanic Majesty, who, indeed, must be the greatest of inventors. In this capacity I frankly admit myself to be a devil worshipper, and I cannot help feeling that I am at this moment amongst friends and not amongst theologians.

Gas is a projectile which requires little direction, weak propellants, and which hits the tiniest of targets hidden away in the vastest of areas. Further than this gas may be made a humanizer, for it need not be lethal. Gases may be produced which will send the enemy to sleep, make him laugh until he cannot pull a trigger, vomit, sneeze, or be inflicted with internal troubles.

Picture to yourselves a battleship with a sneezing-stricken crew, then a whole fleet gassed by submarines well under the water, each with a hose pipe floating on the surface thirty feet above them.

Respirators are adjusted, but the gas is unknown to its swallowers; it penetrates their respirators, for, being unknown, so is its antidote. Fifty thousand sneezing men abandon gun and boiler, and the battle is won not by killing the enemy (how brutal), but by bloodlessly forcing him to sneeze against his will.

Here is a certain antidote:—Don't breathe the outer air. This is very simple at sea, for sailors live in a box which can be made air-tight like a submarine; but imagine the wretched infantryman with a salvus set added to his 72 lbs. of kit. Impossible—his mobility will be zero.

Now take the Tank—the Land Ship. It can be made gas-proof much more easily than the submarine can be made waterproof. Its crew can live on oxygen or compressed air, its engine can be run off accumulators. The gas king is dethroned, but only after having driven muscular warfare off the barrack yard and the battlefield.

If we want progress we must seek opposition. The opposition of the critics to the development of the Tank has been the main spring of its astonishing progress, for happily the Tank has had strong supporters whose constitutions have been virile enough to throw off the virus, happily also because, all said and done, the Tank is pre-eminently a common-sense machine.

Let us now become clairvoyant as regards the future. The professional seer looks inside your hat before she tells you your fortune. A very sensible act. She consults the past, gauges your value by the name of the shop you bought your hat at, and then spins you a story on at least one sound foundation—your probable income.

I have shown you the inside of the Tank hat, and I hope you will agree with me from what you have seen that it was good enough value for money spent to permit me spinning you a story.

I see a fleet operating against a fleet not at sea but on land: cruisers and battleships and destroyers. My astral form follows one side and I notice that it is in difficulty; it cannot see; there appears an aeroplane and gives it sight. It says by wireless telegraphy the enemy are yonder. The approach march begins. I see a man in one of the aeroplanes whose head is swollen with the future; he is the Commander-in-Chief of the land fleet I am following. Suddenly I see the fleet is moving a few points north-east; the Commander-in-Chief has spoken to it by wireless telephony. I sniff the air; it seems impure. Is it gas? The Tanks submerge; that is to say, batten down their hatches. The battle begins.

Out go the mine-sweepers; we are in the enemy's land. A series of detonations show that the act was not executed a moment too soon.

The enemy's fleet concentrate their fire on the gaps made. The Commander-in-Chief is again talking. A small squadron moves to the north, tacks east, and huge clouds of smoke pour across the sky. New gaps are made and the fleet moves through.

Then I see the old scene re-enacted—the contest between armour, gun-fire, and mobility.

The enemy is disorganized, demoralized; his flag aeroplane has been brought down; his brains are paralyzed; it is now the pursuit.

A great river winds across the picture. I put spurs to my astral shell; the enemy must either drown or be pulverized. I rub my etheric eyes; his machines are rushing down the banks, and, plunging into the water, they churn it to foam as they swim through it. Ours follow suit; it is now a race for mobility. I materialize and am in Whitehall, and so I will go back to 1916.

The first Tank operation ever planned was a naval one. The project was to use the first Tanks made in a landing operation on the Flanders coast. It came to nothing, but it was revived a year later when great preparations were put in hand.

The project was an interesting one, destined, however, like the first, never to take form.

The operations at Ypres, in 1917, were, when once Roulers was taken, to be followed by an invasion from the sea between Nieuport and Ostend. Landing troops along this stretch of coast was most

difficult; the water was shallow, the beach was wired, the sea wall was a formidable obstacle some twenty feet high surmounted by a heavy granite coping stone, and beyond were the enemy's guns and machine-guns in great strength, and, further inland still, innumerable dikes and canals.

The grand tactics in this case were based purely on "surprise"; a naval bombardment was out of the question, for, though the sea wall could easily have been destroyed, no penetration inland could have been effected without terrific cost, were the enemy prepared to meet it. It was, therefore, decided to use Tanks.

I might note here that it is a curious fact that, whenever an abnormally difficult operation had to be undertaken during the war, the Army called upon Tanks. Abnormally difficult operations are not the most suited to any weapon, and it was in the easy operations that the Tank effected the greatest tactical economies. This is common sense, but common sense is not always tantamount to common vision.

This is what the Tanks—Mark IV.'s, remember—were asked to do:—

Land from the sea, mount a 20-foot concrete wall with a slope of about 1/2, climb over a coping stone which projected two feet over the top, destroy the enemy's machine-guns and haul up over the wall guns, tractors, lorries, and scores of tons of ammunition and supplies. The initial landing was to take four minutes.

Huge pontoons, some 600 feet in length and pushed forward by two monitors, were to carry the Tanks, troops, vehicles, and stores.

The main difficulty was the coping stone, for though the Tank would just take the slope, directly its nose bumped the projecting cornice the machine slid down into the water.

A facsimile of the sea wall was built and portable ramps constructed which could be carried in front of the leading Tanks. Directly the ramps struck the coping they became detached, and the Tanks, which were fitted with wooden spuds, walked up them like a cog-wheel moving along a ratchet.

A special party of men practised climbing the model wall for some three months and became adepts in this work, but our disasters suffered at Ypres never permitted of this novel landing taking place.

It was a clever scheme, but how clumsy when viewed from future possibilities. Let us glance at these and see how this type of naval and Tank operation may be simplified.

From the naval point of view the main drawback was that the Tank could not swim. What a detail, for as the sailor has created the submersible ship, so can the soldier create the floatable Tank.

Let us all, this time, get into our astral shells, for this is a naval as well as a military operation.

We see a stretch of weary sand—it is the Baltic coast. We see curious ships racing through the Skagarak. They are now standing out a mile or more from the coast, for the water is shallow. There is a rumbling sound, then from their prows squat objects splash into the water—they are moving rapidly towards the shore line; from the water they crawl on to the sands; they are Tanks, and Warnemunde,

150 miles from Berlin, is ours. We materialize and find some commotion going on amongst the enemy's armies on the Western Front.

From the surface Tank carrier the next step is the submarine Tank carrier—a kind of sea serpent which spews monsters on to the beach. What would Olaus Magnus think of this, he who wrote of sea serpents fashioned of skin and blood?

Think now what such possibilities mean to us islanders. No longer will our sailors belong to the Great Silent Fleet but to a fleet which belches war on every strand, which vomits forth armies as never did the horse of Troy, and which will swallow them up again if the land appears unpropitious and carry them safely home beneath the ocean.

Think of the naval bases seized and the landing places protected. Think of the channel which separates us from Europe. It has been called a "ditch"—it may become a veritable tube railway for hostile armies.

Munchausen! Munchausen! Perhaps; but do not let us disparage our inventive genius like a certain Italian alchemist did his own at the beginning of the 16th century. He promised to fly from the walls of Stirling Castle to France. He attempted to do so and, falling, broke a leg. He attributed his failure to the fact that he used for his wings feathers of fowls which, he said, had an affinity for the dung-hill!

It was not his feathers which had an affinity for this unpleasant heap, but his brains. He had been thinking backward of Icarus; he should have been thinking forward in terms of the Wright Brothers.

A lesson. Do not let us now, in 1920, only look backwards to 1914. Let us think forwards to 1930, or we shall become pillars of salt in an arid and unproductive wilderness. Let us look ahead; the world is getting small, but science is vastly huge. Every rational thought is a true thought which may lead to realizable effect. There is nothing too wonderful for science—we of the fighting services must grasp the wand of this magician and compel the future to obey us.

DISCUSSION.

DR. MILLER MAGUIRE: Ladies and Gentlemen. It seems that the extraordinary vision of the future which has just been set before us by the learned lecturer has been either too dazzling or too mysterious for the average man, and accordingly, instead of members of the audience jumping up at once to ask questions about the future, they are almost all of them suffering from perennial silence. I merely get up to speak because I am one of the very few people in England who did not invent a tank. Nearly every person of my acquaintance, not only did so, but he is sending in huge claims for damages to a Government which does not recognize the feasibility of his scheme. I think I shall go home and study the future of war from the point of view which has been set forth so brilliantly by the learned lecturer, and try and design some form of tank which will carry on its front a battering ram, such as the ancients used, which will demolish all kinds of obstructions, such as coping stones and walls. A more instructive and scientific lecture it is scarcely possible to conceive. I happened to be one of those who, before the war, suggested that, even as the Romans of the Old Empire, and the Romans of Byzantium, and the Saracens of Mesopotamia

had moving machines with which they could approach fortifications with comparative immunity, having regard to the weapons then used—pikes, bows and arrows, and guns that would not hurt anyone at one hundred yards at the most, such as we had at Cressy, it was extremely likely that in future campaigns somebody would think of another kind of moving machine which would give security as well as mobility to the advance, and that of such machines our army could make use. There is nothing which any army ever did in the past that British soldiers and men, particularly scientific men such as we often have in this theatre, as the learned Secretary knows, need be afraid of. If it is wood, this country had the best oak in the time of Charles II., and the best trees were used by Nelson in the time of Napoleon. If it is iron that is in question, who can make better protective iron than the people of Scotland and Lincoln? and if it is coal that is in question—but perhaps I had better not say anything about that, because I believe the English miner, among his other good qualities, has been so skilful in the past in producing coal that he will not produce the amount that is now required. It is a very singular thing that whereas certain mountebanks, and charlatans, and humbugs and politicians are holding meetings about the League of Peace, we in this room are considering more than ever the destructive antithesis in the shape of instruments of war. For my part, I pin my faith on the gallant lecturer rather than on preposterous politicians. History is with us, and I think it is necessary to look a little at the past. After all, the oracles of time will always guide us. After all, what are the main things we have to consider?—blood, nerve, humanity. You must have a good sound nervous system, a good sound big body, and any amount of brains, and if we have these we can easily get everything else, if the Government will allow us. I would ask the learned lecturer: Can we now, any more than in the days of Napoleon, hope to conquer whether by iron or steel or any other weapon without these inherent intellectual and physical qualities? The learned lecturer said he is not a Munchausen.

COLONEL FULLER: I may be.

DR. MILLER MAGUIRE: I hope you are not. I was taught not to believe a single word that Baron Munchausen ever said, whereas I am beginning to believe every word that the lecturer has said. Although the learned lecturer is not a Baron Munchausen he deals with wonders. Each age has its own wonders. Some of you gentlemen here will remember that, as the learned lecturer said, on a certain occasion in 1862 the Confederates built a boat and protected it with armour which outsailed the Federal vessels. That vessel nearly outsailed the fleet of McClellan coming down to attack the Confederates, but to the horror of the owners of those vessels it completely outsailed them, including the "Monitor." Then we were told that no more fleets would steam on the sea. I had a relative who laughed at the idea, and he went to a gentleman called Armstrong, somewhere in the north of England, I believe, and asked him: Could not he make a gun. He said he could. He asked: "What kind of gun can you make?" Said he: "A gun that will drive that devil"—of whom our friend the lecturer is a worshipper—"back to his own hell." Accordingly the era of the ironclad ship was superseded by the era of the tremendously hard pounding weapon which beats it to bits—the gun against the ironclad. So it will ever be. What one man can do another man can do. The brain of humanity is always changing and working as against other human beings, whether on the land, in the air, or under the sea. The moment I conceive the idea of a watch which is only a silver one, my richer relative conceives the idea of a golden one that will go for ever. That is the contest—in trade, in navigation, in war. That is the model of all human progress from the machine that was referred to by the learned lecturer, who is a tremendous

scholar, at Troy. Ulysses was a liar like all politicians, but he was a working man like the friends of the learned lecturer; and he devised a horse from whose interior whole hordes of men jumped forth. As Lord Bacon said, military men were always fond of the ladies. A finer illustration of what science can do, what British brains can do, what Scotch inventive genius can do, it is impossible to imagine so far as the construction of the tank is concerned, and that can be done again against any opposition whatsoever. But, remember, the other nations can get a machine too. We had cannon at Crecy; the enemy then got cannon too, and we had to make better.

I am tempted to go on for an indefinite period, but time does not allow; and I therefore conclude by expressing high admiration for the variety and range of the learned lecturer's historical knowledge, which he has applied to the lecture in a most skilful manner.

GENERAL J. G. STONE: I have only a very few words to say. Unlike the last speaker, I shall not speak to arouse opposition, because I believe everybody here will agree with what I say. Ten years ago I was at the first Flying Meeting held at Rheims, and I recall the fact that Sir John French and his staff came to the President's box. That week was absolutely the most fascinating week of my whole existence; I never expect to have the sensations I then had repeated again during the course of my life, as I am too old to see the same sort of thing happen with regard to the tanks. But I remember very well that, as we were going out to see Sir John French and his staff into their motor-cars, General Grierson took me by the arm and said: "I say, Stone, do you really think there is anything in it?" That is only ten years ago, and it is a very striking fact that such a very short time ago as that some of the best brains in the Army (because I could mention other names but I do not think it would be wise to do so) thought that anybody who took up flying seriously was a little bit "gone in the head." I speak of what I know. My belief and my hope are that now those who take the same line of thought with regard to tanks will not be considered by the Chief of the General Staff and others in authority as being "a little bit gone in the top storey," because I have exactly the same firm belief in the future of the tanks, which the lecturer has so ably put before us, as I had ten years ago in the future of the aeroplane.

MAJOR-GENERAL E. D. SWINTON: Ladies and Gentlemen. After the very illuminating and inspiring lecture we have heard from Colonel Fuller, than whom I need hardly say there is no keener exponent of the future of the tanks, one might be inclined to believe that he, like the quack doctor in the streets, has claimed too many virtues for his specific. To go back just for one moment, I ask you to bear in mind that this new weapon of warfare was originally thought out and designed for one specific purpose, namely, as a cure for a disease which was eating up our British infantry, and it is a rather remarkable fact that, having been produced for that one object—that of meeting the German machine-guns and the German barbed wire—any officer should be able to get up in the year 1920 and suggest that this new weapon will change the whole nature of warfare, as Colonel Fuller has done. I think the difference between his claims and those of the ordinary quack lies in the fact that he has been recommending something that was inherently useful for its purpose, whilst the quack doctor usually, I believe, starts with a pill made of bread or, with a little water in a bottle which is no use to anybody. In regard to some of the developments which Colonel Fuller has mentioned, he specified the suitability of the tank for meeting different forms of attack on the part of the enemy; for instance, gas. I am glad he did so, because I think it has been rather our tendency up

to the present to look upon warfare from the retail point of view—of killing men by fifties or hundreds or thousands. But when you talk of gas, as Colonel Fuller did, you must remember that you are discussing a weapon which must be considered from the wholesale point of view; and if you use it—and I do not know of any reason why you should not—you may kill hundreds of thousands of men, or, at any rate, disable them. When you consider the use of such weapons in the future, which is certain to take place, the enclosure of men in steel vessels (they may be steel or any material which will give the men some protection which their own lungs and skin cannot give them) will be of vital importance. One point to which the lecturer did not allude is ray warfare. I imagine, from the progress that has been made in the past, that in the future we will not have recourse to gas alone, but we will employ every force of nature that we can; and there is a tendency at present for progress in the development of the different forms of rays which can be used turned to lethal purposes. We have X-rays, we have light rays, we have heat rays. Mr. H. G. Wells, in his "War of the Worlds," alludes to the heat rays of the Martians, and we may not be so very far from the development of some kind of lethal ray which will shrivel up or paralyse or poison human beings if they are unprotected. If that happens, the more machines of the tank type that we have the better for us, and if we have the rays the better it will be for the enemy if they have such machines which will protect them and enable them to live and move. The final form of human strife, as I regard it, is germ warfare. I think it will come to that, and so far as I can see there is no reason why it should not, if you mean to fight. In that case, perhaps the tanks would not be such a great panacea, because, short of previous inoculation, it would not be possible to stop the progress of diseases simply by putting men into steel or any other type of enclosed vessels. With regard to the lecture generally, I consider that it has been the best exposition, the clearest vision, of what warfare is likely to become that I have heard. And from the lecturer's experience of this weapon, from the thought and the deep study he has given to the subject, no one is better qualified than he to diagnose and express tendencies, and it is by tendencies that we must guide our future. What are we going to do about it? There is only one thing to do if we are to be ready, and that is to prepare now. That is a platitude, of course. When I say "prepare now," I mean we must envisage these new forms of warfare, and so far as possible expend energy, time, and money in encouraging our inventors and our scientists to study the waging of war on a wholesale scale instead of thinking so much about counting heads and methods which will kill a few individuals only at a time. One possible development of the tank, which the lecturer no doubt thought of but did not mention, is the eventual three-dimensional machine, which will not only travel on the surface of the earth but will also dive or float and possibly fly. That is only a step further in the evolution of his thesis.

Sir E. H. Tennyson-d'Eyncourt, K.C.B. (Admiralty): Sir John Capper, Ladies and Gentlemen. A good deal has been said by Colonel Fuller about the future, and he has carried us far in indicating the possible direction of future development in design, tactics, and strategy. I propose, however, to come down to earth straight away, because there is a great cry just now for economy. There is one point in that connection which Colonel Fuller omitted to mention, namely, that a tank is really a tremendous economy for any army. Quite a small army provided with a comparatively few tanks is certainly the equal of a much larger army without them or with fewer and inferior tanks; in fact, the development of mechanical warfare which Colonel Fuller portrayed is really the greatest help in the direction of economy at the present time that we could

possibly have. I think there is no difficulty in developing designs in some of the directions which he indicated. Up to now the designs of tanks have been limited very severely by the fact that they have had to be carried over the rail. This has kept the dimensions down to very small figures indeed. Once we get away from that, there is no reason why tanks should not develop just as warships have, and become much more powerful weapons. Just as the present battleship with a crew of about 1,000 men is equal to any number of old ones, a big landship will be equal to a very large number of old tanks. Smaller types of tanks will, however, also be required.

I should like to offer my thanks and congratulations to Colonel Fuller on his most interesting lecture.

Brevet Colonel J. F. C. Fuller, in reply, said: Ladies and Gentlemen. I have very little to add except to thank you for the way you have received this lecture and to thank the gentlemen who raised various points for discussion. I entirely agree with Dr. Miller Maguire that as the basis of all progress you must have brains—not quantity, but quality. Good brains will produce an economical army. In that respect I also entirely agree with the remark which Sir Tennyson-d'Eyncourt has just made, namely, that the tank is an economical weapon for this; indeed, it is only a matter of common sense. To prove it you have only got to go outside and count the number of horse 'buses there are on the streets. How many are there? You will not find one. Fifteen or twenty years ago nothing but horse 'buses existed. Horse-flesh did not pay. It did not pay on the road and it does not pay in an army, and the same applies to all muscular types of warfare. In any well regulated factory how is the work carried out? It is carried out mainly by machine tools, not by hand tools. Why? Because it does not pay to use hand tools for a great amount of the work which is done. I was also much honoured and pleased that General Swinton, who probably—coupled with Sir Tennyson d'Eyncourt—had more to do than anyone else with the origin of the tanks, said what he did. The gist of his remarks was: secrecy in the future. In the past it has been difficult to keep a weapon secret, because weapons were hand tools. Innumerable men and innumerable weapons were necessary, and somebody was sure to "blow" the secret sooner or later. The French, as you remember, in 1870, tried to keep the mitrailleuse secret. They kept it secret, but when the day of battle came nobody knew how to use it, and it failed. In mechanical and scientific warfare it is possible, by replacing to a very considerable extent man-power by machine-power, to evolve and create machines, especially projectile machines like those for gases, of which the man himself who discharges them has not the faintest conception, though their effect on the enemy may be colossal. The future is based on the present: the present is based on the past. If we do not step forward to-day we shall be marking time, and if we mark time now, ladies and gentlemen, believe me, we shall be marking time in our own graves.

The Chairman: Ladies and Gentlemen. It now only remains for me to say a word or two in moving a vote of thanks to Colonel Fuller for his excellent lecture. Before doing so, the Secretary desires me to say that the Muesum of the Institution is still without a model of a tank. Perhaps some of the audience could rectify this and present such a model to the Institution. If the Tank Corps, Sir Tennyson-d'Eyncourt, and General Swinton were to ask Sir Dudley Docker and Sir William Tritton to give the Institution small models of the tanks of the two types for which they were so largely responsible, I feel convinced that they would do so. I therefore ask the Tank Corps if they will kindly move in the matter.

What strikes me most about this lecture is that it is extraordinarily wonderful that the Royal United Service Institution, which is a very serious body of military students, should in this year of 1920 be carefully listening to a lecture of this sort, instead of being snuffed out of the room, as I am sure it would have been in 1910. It shows that we are thinking forward, and we have got to think forward. General Stone has mentioned how backward we were in thinking forward in regard to aeroplanes, and we all know what the aeroplane meant in this war. The tank is practically only three years old, and we must use our best endeavours to press forward its evolution, because we cannot afford to be caught napping and to find that somebody else with whom we go to war has got a better machine and better possibilities of making a machine than we have. It is most important to realize that, so far as I know, under the very best conditions of construction that you can get, before you can produce tanks of a new type in sufficient quantity to outfit even a small Tank Corps, you have got to wait a whole year, so that if you are a year behind at the commencement of a war you may be that year behind for the whole of the war, and run serious risk of being defeated. The matter has got to be taken up in time. We must impress that upon our rulers, and, if they will not look forward and believe what we say, we have got to make them believe or tell them that they must go. Ladies and gentlemen, on your behalf I propose a very hearty vote of thanks to Colonel Fuller for the very illuminating and capable lecture he has given us here this afternoon, and I ask you to accord that vote of thanks to him by acclamation.

The resolution of thanks was carried by acclamation.

COMMANDER W. F. CABORNE, C.B.: Ladies and Gentlemen. Before we separate I ask you to pass, by acclamation, a very hearty vote of thanks to the Chairman for presiding this afternoon, and for the very valuable remarks he has made.

The resolution of thanks was carried by acclamation.

The meeting then terminated.

BRIEF NOTE ON STRATEGY AND TACTICS OF THE CAMPAIGN IN THE CAMEROONS.

By LIEUT.-COLONEL A. H. W. HAYWOOD, C.M.G., D.S.O., R.A.

On Wednesday, February 18th, 1920, at 3 p.m.

LIEUT.-GENERAL SIR HERBERT MILES, G.C.B., G.C.M.G., G.B.E., C.V.O., in the Chair.

THE CHAIRMAN : Ladies and Gentlemen. I have great pleasure in introducing to you the lecturer, Lieutenant-Colonel Haywood, who was in Nigeria in the first place as a member of what we call the W.A.F.F., the West African Frontier Force, and after that he took part in the campaign in the Cameroons and commanded one of the columns which marched towards one of the strongest places—Jaunde. I think we are very fortunate in having induced him to give us an account of the campaign.

LECTURE.

THE strategical importance of the Cameroons to the enemy consisted in the possession of:—

(*a*) One of the finest natural harbours on the west coast of Africa.
(*b*) The wireless station at Duala.

In order to deny these to the enemy it was necessary for the British Government to send out an expedition whose objective was Duala. After the capture of Duala it became necessary to pursue and destroy the enemy's forces.

Our local command of the sea was of first-rate importance. The Navy did excellent work in stopping ammunition and food supplies from reaching the enemy at various points on the coast, and co-operating up creeks with land operations.

To understand the difficulties of keeping up communications between the different groups of Allied forces it is necessary to realize that the extreme length of the country from north to south is 800 miles, while the extreme breadth from east to west is 600 miles.

The topography of the country necessarily varies considerably owing to the large area it covers. The main features are the Cameroon Mountain, rising to 13,000 feet in the south-west corner in the neighbourhood of Buea, and the central plateau of Ngaundere.

The southern, or coastal, belt for a width of seventy to eighty miles from the sea is covered with heavy forest, in which the trees often rise to a height of 200 feet. The intervals between trees is filled

with undergrowth so dense that it is often impossible to see five yards through it.

North of the forest belt is a belt of grass country which grows thinner as it reaches north.

Roads are practically non-existent, with the exception of a fine motor road from Kribi to Jaunde. In the main other routes consist of narrow paths some ten or twelve feet wide.

These paths, particularly in the forest country, were admirably adapted to defensive tactics. A few determined rifles or machine-guns (with which the Germans were well supplied), concealed in the bush at each bend of the path, were able to cause heavy casualties and seriously delay the advance.

The forest country lent itself to ambushes to a peculiar degree, thus necessitating considerable caution on the part of an advancing column.

Only two railways existed:—

The Midland railway, Duala—Eseka (120 miles).
The Northern railway, Bonaberi—Nkongsamba (100 miles).

The main administrative centres were connected by telegraph with Duala and to each other, but of course lines were destroyed as the enemy retreated. Wireless telegraphy was found to be quite useless in the forest country—either the trees or the atmospheric conditions seemed to confuse the sound waves.

All rivers and creeks are only navigable for a few miles inland from the coast.

The enemy's tactics were an active defence. He made skilful use of the heavy bush country to conceal prepared positions, for rearguard actions, and for laying ambushes.

This necessitated careful scouting on our side—columns on the march had to be protected by numerous skirmishers in front and on the flanks.

Baggage and supply columns were a source of constant anxiety to the column commanders, and were always most vulnerable.

Transport of supplies and ammunition had to be done by porters. In some cases the lines of communication of columns was several hundred miles long, thus making the supply question a very difficult one.

The first advance on Jaunde failed largely on account of the difficulties created by transporting supplies on men's heads. General Dobell therefore decided to make a motor road and use Ford lorries for the second, and successful, advance on Jaunde.

The troops engaged on both sides were West African natives, although an Indian battalion and a battalion of W.I.R. reinforced General Dobell in the latter stages.

The West African soldier is very mobile and can generally live on the country. In this campaign, however, the Germans denuded the farms of supplies during their retreat, and it was necessary to provide rations.

Columns normally consisted of a few companies of infantry, several machine-guns, and a proportion of artillery—guns were not of much use in the bush country, although their moral effect was considerable.

Situation on Outbreak of War.

On the outbreak of war four columns drawn from the Nigeria Regiment were concentrated near the German frontier:—

(*a*) The Maidugari column under Captain R. W. Fox, Royal Warwickshire Regiment.
(*b*) The Yola column under Lieut.-Colonel P. Maclear, Royal Dublin Fusiliers.
(*c*) The Cross River column at Ikom under Lieut.-Colonel G. T. Mair, D.S.O., R.A.
(*d*) The (Reserve) Calabar Column under Lieut.-Colonel A. H. W. Haywood, R.A.

Soon afterwards it was decided to send an Anglo-French Expedition, under Brigadier-General C. M. Dobell, D.S.O., against Duala, and three battalions Nigeria Regiment were to be held in readiness to join it.

The rôle of the frontier columns was henceforth to be one of local activity only.

The initial operations of three of these columns were attended by misfortune:—

(*a*) The Maidugari column crossed the frontier on August 25th and encountered the enemy in an almost impregnable position at Mora on August 27th. It suffered severe casualties and thereafter took up a position south of Mora to prevent the garrison joining that of Garua.
(*b*) The Yola column crossed the frontier on August 25th and had a fight at Tepe. It then attacked Garua on August 30th-31st. The attack failed, our losses were heavy and the column fell back on Yola. This column was subsequently joined by a French force under Lieut.-Colonel Brisset, who had marched from the Chad area after capturing Kusseri on September 20th.
(*c*) The advanced troops of the Cross River column occupied Nsanakang after slight opposition. On September 6th they were surprised by a superior force, and after a gallant fight were nearly annihilated. The German losses were even heavier than ours.

Owing to the extent of the theatre of operations (306,000 square miles or one and a half times the size of the late German Empire) and the extremely poor communications, effective control by one commander was an impossibility—consequently the forces were divided into three groups acting to a large extent independently. These were:—

(1) Main Allied force under General Dobell in the south.
(2) Northern force under Brigadier-General Cunliffe.
(3) Eastern Franco-Belgian force under General Aymerich.

Briefly the plan of campaign was to:—

(1) Capture Duala by the joint naval and military operations of an Anglo-French force under General Dobell.

(2) Invade the Cameroons by the co-operation of Anglo-French troops from the north.

(3) Advance from the French and Belgian Congo in the east.

STRENGTH OF ENEMY.

(*a*) 176 Europeans, 2,000 native troops, 7 field guns, and 100 machine-guns. In addition there were a large number of European civilians who were subsequently enrolled, while the native forces were increased to 4,000, excluding irregular levies.

STRENGTH OF EXPEDITIONARY FORCE.

(*b*) *Main Force, General Dobell.*—4,300 West African native troops, increased to 9,700, including Indian troops, by November, 1915 (14 guns).

Northern Force.—3,250 West African natives (including 750 French troops), also 7 guns (including 2 with Cross River column), 15 machine-guns (4 with Cross River column).

Eastern Force.—3,270 French native troops (including 580 Belgians). These were ultimately increased to 4,000.

General Dobell's transports and naval escort arrived towards the end of September.

The campaign can now conveniently be divided into two phases:—

"A," September, 1914—June, 1915.
"B," July, 1915—February, 1916.

"A."

General Dobell's first objective was Duala. Although the entrance to the harbour had been blocked and mined the obstructions were successfully removed. On September 26th H.M.S. "Challenger" bombarded the town, while a land demonstration was made by way of a neighbouring creek. On 27th Duala and Bonaberi surrendered. This secured a safe base for future operations, while 400 Europeans, 40,000 tons of shipping, and much material were captured.

In order to consolidate the position won the following operations were undertaken:—

(*a*) Capture of Japoma Bridge, October 5th—6th, on the way to Edea, whither the main German force had retired.

(*b*) Advance up the Northern railway, capture of Maka and Susa, October 14th.

(*c*) Attacks on and final capture of Jabassi on October 14th, 1914. The first attack failed.

The next objectives were:—

(*a*) Edea, which was captured on October 26th by combined naval operations via the Sanaga River. The operations were admirably carried out, but not without severe fighting.

(*b*) Capture of Victoria, Soppo, and Buea on November 15th. The operation consisted of an attack overland by Susa and Mpundu, combined with naval operations via Tiko and Victoria, while the Susa column cut off the retreat northwards. The energy with which the attack was pushed seemed to demoralize the enemy, who suffered severe casualties.

After the capture of Buea a strong British column under Colonel Gorges was concentrated at Mujuka on December 3rd. This column fought its way up the railway to Nkongsamba (railhead) protected by a small column on its left flank.

Colonel Gorges now pushed on a column under Lieut.-Colonel Haywood to Bare, which was surrendered. An advance was then made on Dschang in two columns. The main column advanced by the direct road, fighting all the way. Haywood's column moved on the left flank, and, after capturing Mbo Fort, joined Gorges outside Dschang, which was occupied on January 3rd. The fort was destroyed and the force returned to railhead and Bare.

Early in 1915 the situation was as follows:—

(*a*) *Enemy*.—These were distributed in six main columns exclusive of the garrisons of Garua and Mora:—

(1) *Western*: Widekum—Bali—Bamenda (strength, 300).
(2) *Dschang*: Blocking roads to Bamun and Bamenda (strength, 600).
(3) *Reserve*: Esu—Kentu—Bekom (strength, 300).
(4) *Marwitz*: Retiring on Lomie (strength, 470).
(5) *Eastern*: Dumie Station (strength, 500).
(6) *Main*: Dehane, Sende, Ngwe (strength, 900).

The Germans now numbered 500 whites and 4,000 native troops 1,000 whites had been captured and deported by us.

(*b*) *Allied troops*—

British troops holding Duala, Northern railway and Bare Victoria and Dibombe.
French troops on the Midland railway up to Edea; also a detachment at Kribi.
Ships and armed craft had effected a blockade and were patrolling all ports and navigable waterways.
General Aymerich's forces were 400 miles distant but had begun to make their presence felt.

On January 5th a determined attack was made on Edea by 800 troops. This was beaten off with heavy loss to the enemy.

As a result of a conference at Duala it was decided to prosecute the northern campaign actively and attack Garua; for this purpose all French troops in the north (750) were placed under General Cunliffe.

In February and March, the enemy made two determined attacks near the northern railhead.

(1) At Mbureku, on February 3rd, Lieut.-Colonel Cockburn's 1st Nigeria Regiment was heavily attacked; but defeated the enemy with heavy loss.

(2) Lieut.-Colonel Newstead, commanding the Sierre Leone Battalion, attacked Harmann's Farm on March 4th, but was forced to retire after a heavy engagement. Our casualties in these two actions amounted to 120 killed and wounded.

During this period the Eastern French force was in four columns, and had advanced as follows:—

(1) Oiem column, to Bitam (Commander, Le Meilleur; strength, 700).

(2) Sangha column, to Eta — Ngata — Medum (Commander, Hutin; strength, 800—580 Belgians).

(3) Mwadi column, towards Akoafim (Commander, Miquelard; strength, 500).

(4) Lobaye column, to Carnot—Baturi, but was forced to retire to River Kadei (Commander, Morisson; strength, 700).

The chief difficulty of the Eastern force was supply, hence progress was slow.

On March 12th a conference was held at which it was decided to make a general advance on Jaunde.

In April Lieut.-Colonel Haywood, with a column of 650 men, advanced from Edea and captured Ngwe after a stubborn fight. (April 14th.)

On May 1st Haywood's column advanced towards Wumbiagas, while a French column (1,000 strong), under Commandant Mechet, attacked Sende.

The former captured a formidable position at River Mbila on May 4th after serious fighting.

The French made a gallant attack on Sende, which was captured on May 4th, and then occupied Eseka, where considerable rolling stock was seized.

The advance on Jaunde was carried out by the two combined forces under Colonel Mayer, starting on May 25th. Supply difficulties, stubborn opposition, and heavy rains caused us much hardship and severe casualties. At every turn of the road the advance was met by severe machine-gun fire. It took two days to capture the Njok position. Soon also dysentery broke out and caused heavy losses, finally the loss of a convoy of 500 loads made matters critical.

At this time news was received that the French Eastern force had been delayed, and it was decided to withdraw to Ngwe. In the retreat the rearguard was constantly attacked. Reinforcements sent from Duala arrived on June 17th at a most opportune moment and relieved the situation. Our casualties were 25 per cent. of the force killed and wounded, in addition to heavy losses from sickness (19 Europeans, 282 natives).

On night April 21st—22nd a force of 270 men under Von Crailsheim broke out of Garua and, joined by fifty men from Ngaundere, attacked Gurin. The attack failed; and, by a wonderful march of twenty-eight hours, Crailsheim re-entered Garua without being intercepted.

In June Garua was captured by the Northern force. This place had been very strongly entrenched and wired. It constituted a formidable fort, protected by field guns which had a longer range than our guns until these were reinforced by one naval 12-pr. and a French 95-mm. gun. The place was approached by pushing forward on successive nights and entrenching. Finally the garrison surrendered on June 10th. Thirty-seven Europeans, 212 native ranks, and much material were captured. Cunliffe then pushed a column on to Ngaundere, which was occupied with slight opposition on June 28th.

"B."

(*July*, 1915—*February*, 1916.)

From July to September, owing to the rains and the necessity for reorganizing and resting the troops, no operations of importance were carried out except reconnaissances along the Njong and Camp Rivers and from Ngwe.

On September 8th and 9th General Cunliffe made three attempts to capture Mora. These failed owing to lack of time and artillery. Further attempts by the French to capture Mora were made from October 30th to November 4th. These were also unsuccessful, and Mora eventually surrendered on the conclusion of the campaign in February, 1916.

On August 25th a conference was held at Duala between General Dobell, General Aymerich, and Governor-General Merlin (Governor of French Equatorial Africa). At this conference the plan was decided on by which the Cameroons was finally conquered.

The plan was as follows:—

General Aymerich, whose troops were now established at Bertua and Dumie, was to co-operate in an advance on Jaunde as before. A force under Colonel Le Meilleur was to cross the Campo River and move on Ebolowa, while a further force from Campo should move parallel to the Northern Muni frontier. At the same time demonstrations should be made from the northern railhead. Brigadier-General Cunliffe's force would exercise all possible pressure from the Northern Cameroons.

In October the British advance started. A column under Lieut.-Colonel Haywood, advancing from Ngwe, captured Wumbiagas on October 9th, after a lively action. The operations were much aided by a column under Lieut.-Colonel Rose which moved from the north via Sakbajeme. The French from Edea fought their way to Eseka after considerable opposition at Sodibanga. Advanced bases were established at both Wumbiagas and Eseka.

During this period the Ossidinge column, in co-operation with a column from Bare under Lieut.-Colonel Cotton, advanced on Bamenda and occupied this place on October 23rd.

SITUATION, NOVEMBER, 1915.

(*a*) *Enemy*—

Main force Dschangmangas and Jaunde	.. 2,400 Rifles. (40 Machine Guns.)
Ebolowa	400 Rifles.
Bamenda	900 ,,
Eboko-Manga	470 ,,
Mora	120 ,,

(*b*) *Allies*—

Location.	Commander.	Rifles.[1]	Objective
(1) Wumbiagas	Col. Gorges	1,800	Jaunde
(2) Eseka	Col. Mayer	1,200	Mangeles
(3) Dumie, Bertua, Deng-Cheng	Gen. Aymerich	2,000	Nanga, Eboko and Mendang
(4) Bitam	Lt.-Col. le Meilleur	1,000	Ebolowa.
(5) Ngaundere	Gen. Cunliffe	1,600	Banjo
(6) Ngaundere	Lt.-Col. Brisset		Tibati
(7) Bamenda	Maj. Crookenden	500	Fumban
(8) Bamenda	Lt.-Col Cotton	500	

Total forces about 7,000 British ; 5,000 French.

During November :—

(1) Njok was occupied by the main force and held in spite of repeated attacks in which the enemy suffered severely.
(2) Mayer did not move.
(3) Aymerich reached the line Nanga—Ebok and Mendang.
(4) Le Meilleur reached the Ntem River and prepared to attack Ambam. He sent a detachment to succour the garrison of Akoafim which was besieged.
(5) Cunliffe and Brisset occupied Tibati—Banjo—Fumban. The strong position of Banjo Mountain was captured after two days and nights of heavy fighting, November 4th—6th.

During December :—

(1) Gorges captured Dschangmangas on December 17th after several stiff fights on his right (about Lesogs), November 25th—26th. Casualties, 28 killed, 102 wounded.
(2) French advance from Eseka was severely opposed and they suffered heavy casualties. Mangeles was taken on December 21st after five days' fighting. Casualties, 25 Europeans, 243 native ranks.

[1] Excludes L. of C. Troops.

(3) Aymerich gained touch with Cunliffe.
(4) Le Meilleur did not move. The Campo detachment was put under his orders after suffering a reverse at River Bitam.
(5) & (6) Cunliffe and Brisset reached line Ndenge—Ngila and were in touch with Aymerich.

On January 1st Gorges occupied Jaunde after several sharp engagements. The Germans retreated south and south-east.

Lieut.-Colonel Faucon was directed on Ebolowa, which he reached on 19th after opposition at Kato River, while Lieut.-Colonel Haywood was despatched with six companies and two guns towards Widemenge. Here touch was obtained with the German rearguard and British prisoners were released. Haywood, reinforced by 800 French and four guns from Aymerich, reached Ebolowa on 22nd after slight resistance. In the meantime two companies, under Major Coles, had been sent to reinforce Faucon. This column had a fight at Elabe on 18th, capturing thirteen Europeans and inflicting several casualties. Coles and Haywood got in touch this day.

On January 23rd Haywood pushed south after the retreating Germans. He overcame stiff resistance at Mafub and drove the enemy on Mintum and Daing. On 27th he gained touch with Le Meilleur at Ambam. Aymerich's troops and Cunliffe's force reached Jaunde by December 9th.

Aymerich now took command of the operations on the Spanish frontier, while all British troops were withdrawn to the coast and Jaunde.

Aymerich directed his troops for a converging movement on Maka, but the Campo detachment failed to close the gap, and the Germans withdrew to Muni, where they were interned.

Mora garrison capitulated on February 17th.

DISCUSSION.

CAPTAIN CHARLES SLACK : There is only one question I should like to ask in regard to the lecture itself. I am sure it would be of interest if the lecturer can state the settlement which has been arrived at between the French and the British Governments as to the disposition of the country. The last I read about it was to the effect that the French were to take over as their part about one-third of the Cameroons, and if the lecturer can give us any definite information on that point, I am sure we should all be glad to hear it.

SIR CHARLES LUCAS : Mr. Chairman, Ladies and Gentlemen. As a civilian I desire to express my great admiration for the work done in this campaign, which I have studied rather closely in a small way. The most able way in which the outskirts of the Empire were held during times of stress and difficulty ought, to my mind, to be made far better known to the general public than it is. I think I am right in saying that in the Cameroons campaign native soldiers alone, officered by white men, were employed. That was not the case in East Africa nor in South West Africa. I should also say that this campaign stands out as the most extraordinary instance of able and successful co-operation. The Navy, under Captain Cyril Fuller, seemed to work with the Army to perfection; the French and the English worked together admirably; and to a layman like

myself the way in which columns directed on a particular point and coming from perhaps one hundred miles in different directions, arrived at that point on the same day was extraordinary. It is not as though they were going along British railways or British motor roads ; they were going through country which possessed nothing but native tracks, at times making their way through dense bush. This could not possibly have been done unless there had been very able and tactful heads at the helm, and also unless there had been most efficient leaders of the battalions and columns. The only quarrel I have with the lecturer is that of necessity he could not mention the word " Haywood " in his lecture ; but those who read the history of this most interesting campaign will find that name perpetually occurring as one of the ablest men that served during it. As I say, I speak as a man who knows nothing of soldiering, but who yet delights in military history ; and I desire to say as an ordinary British citizen that I am very proud of this campaign and of the men who carried it through. I think Mr. Asquith, with his usual command of graceful English, said the right thing in the House of Commons when he remarked that this campaign was perhaps one of the most complete episodes in the history of the war. In conclusion, I should like, if I may, to be allowed to move a very hearty vote of thanks to Colonel Haywood for his most interesting and instructive lecture.

DR. MILLER MAGUIRE : It would be a great pity if this vote of thanks should hang in the air, so to speak, or, at any rate, not be seconded, and therefore I second it most heartily. The honourable lecturer has omitted to mention his own exploits, but that has only directed more attention to his merits. It is impossible to imagine the campaign in the Cameroons without referring to the gallant lecturer, and the less the gallant lecturer says about himself the more one wonders that he is here at all. The fact that he got through those thick forests and over hitherto unexploited rivers, and co-operated with the Navy, and made converging movements worthy of Von Moltke, seem to me to be worthy of the highest admiration by this audience. I could go on talking, if you allowed me to do so, about events in Africa, but that was not the only part of the world where we distinguished ourselves. Among the names of officers connected with the Cameroons campaign, the name of Haywood will always stand forth in a very distinguished manner. I could not exactly follow all he said about the map, but, of course, that is only natural; one does not learn the geography of a country like that in about an hour and a quarter. It takes some time to learn the geography even of Connemara, let alone the Cameroons. These things cannot be done without some trouble. But I understood, from what the lecturer said about the map, that there was a big mountain there, the Cameroons mountain, I think he called it, and that we were wedged in between the Germans and the French. I hope we shall retain as much as we possibly can of the Cameroons and of the other places in Africa where we fought the Germans. I enthusiastically support the vote of thanks so well proposed, and, at the same time, I do not yield to the proposer in hearty admiration of the lecturer, whose name will, I hope, be splendidly inscribed in the records of Africa for all time.

LIEUT.-COLONEL A. H. W. HAYWOOD, in reply, said : Mr. Chairman, Ladies and Gentlemen. One question was asked about the distribution of the Cameroons. I am afraid I am not very well qualified to answer that question, but I do know that nearly all the Cameroons was handed over to the French, and I believe that is to remain more or less so in the future. I think about one-tenth of the Cameroons will remain British, and the rest will become French. The British portion will include Buea, and it takes in Bamenda. It passes west of the Northern Railway and then goes north, taking in a narrow fringe along the Western (Nigerian)

frontier. There is a big tribe up in the northern part of Nigeria, a small portion of which came into the Cameroons area when the Cameroons were German, and it has been decided that that tribe entirely shall be included in the British territory of Nigeria.

A MEMBER: That is the district of Dikoa, is it not?

COLONEL HAYWOOD: Yes, Dikoa is to come in, but I cannot remember for the moment the name of the tribe. The result is that we get a very small piece of the Cameroons along the Western frontier, more or less, and the rest is to be under French rule.

THE MEMBER: We actually take in the Port of Victoria, do we not?

COLONEL HAYWOOD: Yes, we take in the Port of Victoria, but the Port of Duala and both the railways go to France.

THE CHAIRMAN: Ladies and Gentlemen. I am sure you all agree that we have had a very interesting lecture this afternoon, and that we are very much obliged to the lecturer for giving it to us. I am quite certain that the vote of thanks proposed by Sir Charles Lucas and seconded by Dr. Miller Maguire will be carried unanimously. I entirely agree with the remarks that fell from Sir Charles Lucas in regard to the difficulties of the campaign. The arduous nature of the operations and the heavy fighting that ensued are apt to be overshadowed by what was taking place at the same time in France and Flanders. Nevertheless, the conduct of the campaign and the methods adopted by which victory was secured are of great importance. We are unrivalled in small wars, but this war differed from our other small wars, because not only were we fighting against the climate and against the savage nature of the country, but we were fighting against an enemy who was led by German officers, and stiffened by Germans who were well acquainted with all the difficulties of the country, of which they took full advantage. The campaign was therefore a very important one. In the August number of the JOURNAL a very interesting diary of this war, written by a Major Meyer Griffith, appeared. He served under you, I think?

COLONEL HAYWOOD: Yes.

THE CHAIRMAN: The lecturer has mentioned in the course of his lecture to-day the difficulties experienced in connection with transport, and Major Meyer Griffith's notes, written in a colloquial sort of way, described these difficulties of getting up supplies, ammunition, and so on. He was killed at Wumbiagas. I would commend that diary to any of the members who are interested in the campaign. There is another point which is noteworthy in regard to both this campaign and the campaign in German East Africa that I should like to mention. They commenced very much on the same lines—that is to say, they started with a failure. We fought in German East Africa, and we were not successful at Tanga. In the Cameroons campaign the columns that went out on the outbreak of the war were apparently unsuccessful also; but we eventually overcame all our troubles and conquered the colony; and whatever may be said of the peace, I think we may say that one solid benefit we have received from the war is the taking of the German colonies.

The resolution of thanks was then put and carried with acclamation, and the meeting terminated.

THE USE OF AIRCRAFT IN SMALL WARS.

By GROUP-CAPTAIN A. E. BORTON, C.M.G., D.S.O., A.F.C.

On Wednesday, February 25th, 1920, at 3 p.m.
MAJOR-GENERAL SIR NEVILL M. SMYTH, V.C., K.C.B., in the Chair.

THE CHAIRMAN: My Lords, Ladies and Gentlemen. In introducing Group-Captain Amyas Borton I ask your permission to say a few words about his qualifications and achievements as one of the most prominent and accomplished of the long-distance fliers and explorers of the great air-routes of the world. The lecturer, who comes of a distinguished military family, obtained his commission in the Black Watch in 1906, and in the early days of flying became one of the pioneer pilots, taking his brevet with a civil firm in 1911, but is was not until 1913 that he joined the Royal Flying Corps. In August, 1914, he flew the Channel to take part in the war as a pilot in one of the original squadrons. In June, 1915, while on a reconnaissance round Ostend and Bruges, he was severely wounded, but with great pluck succeeded in fighting his way back to one of our forward aerodromes. As soon as he was out of hospital, Group-Captain Borton formed a new squadron and took it to France in January, 1916, where it was continuously employed in bombing and fighting until he left its command after the Somme battle, in August, 1916. We next find him in command of the Royal Air Force units in the Sinai Peninsula under the orders of Major-General Sir Geoffrey Salmond, who was directing the activities of the Air Forces in all theatres in the Middle East. This little air force developed into the Palestine Brigade, which Group-Captain Borton commanded up till the Armistice. While on a month's leave in the summer of 1918, he was allowed by the Air Ministry, on the recommendation of General Salmond, to attempt the flight from England to Egypt *via* Crete. Major MacLaren was his second pilot, and they completed the trip according to programme in ten days. Group-Captain Borton's particular machine, a Handley-Page twin-engine, did great work in the final advance in Palestine, piloted by Captain Sir Ross Smith, of Australian flight fame. After the Armistice Group-Captain Borton, with Ross Smith in the Handley-Page, were the first to fly to India, accompanied by General Salmond, on a tour of inspection. From India, the lecturer and Ross Smith reconnoitred by sea the air route to Australia as far as the most eastern of the Dutch East Indies, returning to India and later to England in September last. This reconnaissance led up to that wonderful achievement, the first great flight to Australia. With these few words of preface I now have much pleasure in asking Group-Captain Borton to kindly proceed with his lecture.

LECTURE.

IN considering the subject of this paper two main difficulties present themselves.

Firstly, the definition of the term "small war." In pre-war days our commitments as a nation could be to a large extent foreseen, but the present state of unrest throughout the world makes it hard to place a limit on the variety of theatres in which it may be necessary for the forces of the Empire to operate.

Secondly, the factor of aircraft in war is a new one, and of necessity the methods of employment of the new arm have developed as need arose, and its potentialities grew and were better appreciated.

I propose, therefore, to attempt to give a general outline of the main operations in which aircraft may in the future be called upon to take part, and, as far as possible, quote instances from the recent war, preferably drawn from theatres other than the Western front, illustrating how various situations have been met by aircraft, and the methods of their employment.

With regard to the second difficulty which I have mentioned, I should like to give a brief *resumé* of the growth of the tactical activities of the Royal Air Force in order to emphasize the fact that this growth is by no means complete, and if I should venture to forecast future and as yet unproved possibilities, it must be remembered that the accomplished fact of to-day would have been regarded by the majority six years ago as the ravings of a monomaniac.

Prior to the war the technical limitations of aircraft rendered the duty of reconnaissance practically the only one which it was possible to carry out, although the future possibilities were fully realized, and a system of co-operation with artillery was being practised.

In other words, aeroplanes were not capable of carrying the weight of equipment, such as machine-guns, bombs, wireless apparatus, and cameras necessary for other duties.

The duty of reconnaissance is one which has not altered fundamentally, except with the needs of intelligence, and the increased efficiency of aircraft. On the other hand, the importance of co-operation of aircraft with artillery was keenly felt in the earliest stages of the war, and through the initiative and devotion of two very gallant officers, the late Lieut.-Colonel Lewis, R.A., and Lieut.-Colonel James, R.E., then Captains in the R.F.C., the foundation of wireless co-operation with artillery were laid, and the use of squared maps introduced.

It may be of interest to recall that the first squared map used was one prepared in 1914 by Lieut.-Colonel Lewis himself in duplicate, one copy of which he gave to the battery with which he was working, and the other for his own use in the air.

From this again grew the general demand for squared maps, giving up-to-date detail of enemy defences which could only be supplied from the air, hence the growth of aeroplane photography, which ultimately enabled trench systems, battery positions, etc., to be accurately reproduced, and in certain theatres, large tracts of country to be mapped which would otherwise have been *terra incognita* to our troops.

The development of bombing and aerial fighting cannot primarily be regarded from the point of view of this paper as one of evolution

of tactics so much as the technical improvement of the aeroplane itself, and its capacity to carry the necessary weight of bombs and machine-guns. It is more in the field of co-operation of aircraft with troops on the ground that we must look for examples of the gradual widening of the sphere of usefulness of aircraft. It was in the early days of the war that it became the custom for machines re-crossing the lines on completion of their duty to come down to a low height and attack enemy positions with bombs and machine-gun fire.

In the course of one of these attacks a machine of the Royal Flying Corps discovered a party of our infantry held up by the enemy, and was able to disperse the defenders and bring back valuable information of the position of our own troops. From this grew the system of contact patrols to keep our advanced troops in communication with the rear, and the attacks by aircraft on the enemy in conjunction with other arms. The dropping of ammunition on isolated parties in an attack, the laying down of smoke screens, and the various details of co-operation with troops on the ground were the natural evolution from this beginning.

The foregoing remarks are intended to show that, as the efficiency of the aeroplane increased and further experience of its possibilities were gained, so the scope of its employment was widened to meet the ever-increasing demand for its use in assisting the other arms in their operations on the ground, and it may be safely concluded that, whatever those demands may be in future operations, the Royal Air Force will evolve some method of meeting those demands.

Before passing to the detailed examination of the future uses of aircraft, I wish to emphasize the important bearing which the aeroplane has on Imperial strategy. Much has been written on the commercial importance to the Empire of the development of the various aerial routes, but these are of equal if not more vital importance strategically. The opening up of these routes will mean that, from an air point of view, Africa, Arabia, Persia, India, and as far east as Singapore are one theatre, and the whole weight of our Air Forces in the Middle or Far East can be thrown into any of these in the shortest possible space of time. It has been claimed that the mobility of the aeroplane is nullified by its dependence on ground organization, but, provided the aeroplanes with their crews can be transferred by air from one theatre to another, this objection can be overcome by the maintenance of a sufficient reserve of supplies at various points for the needs of the whole force which it is possible to concentrate at that point, and, moreover, the rapid development of the size and weight-carrying capacity of the aeroplane is a factor which tends to simplify the question of the rapid supply of units equipped with smaller fighting craft. The mobile squadron of, say, eighteen two-seater machines will no doubt in the future proceed from point to point by air, followed by its complement of slower weight-carrying machines, bring mechanics, spares, etc., sufficient for its maintenance.

This rapidity of concentration and ability to strike a heavy blow at unexpected points, without the inevitable warning given by the slower movements of other arms, may well prove a decisive factor

in quelling at the outset a disturbance which might otherwise lead to serious and prolonged operations.

We will now proceed to discuss some of the characteristics of small wars, and the special utility of aircraft with reference to these characteristics :—

1. The area of operations is usually large in comparison to the size of the forces employed on both sides, and it will therefore be the primary duty of aircraft to locate enemy concentrations, estimate his strength, direction of movement, bases, etc., and supplement and keep up to date intelligence derived from other sources. The employment of aircraft renders the reconnaissance of a large area possible, and detailed information showing where the enemy is and where he is not must prove an asset of the greatest value to a commander in framing his initial plan of operations.

The radius of action of modern machines allows of the enemy dispositions being watched over distances of from 200 to 300 miles within his own territory, and, where his means of transportation are slow, this allows of ample time for the organization and execution of a suitable plan of campaign by our own Staff.

2. The theatre of operations may be in country which is wild and not sufficiently well mapped to allow of the employment of modern methods and weapons of precision.

This will entail the most careful reconnaissance by aeroplane photography from which detail can be extracted to supplement existing maps, or even prepare new series. In the operations in Palestine in the summer of 1918 some 1,500 square miles of country lying almost entirely behind the enemy lines was surveyed by aeroplane photography, and detailed maps on a scale of 1/40,000 prepared.

In the recent operations against Afghanistan much valuable information was derived from photographs, both for mapping and intelligence work.

It must be emphasized that mapping of large areas in an extremely short time, especially along routes of approach and attack, is a sphere in which aircraft are of vital importance, and a survey at the rate of 100 square miles a day can readily be carried out by a flight of four to six machines, and the production of maps giving a high degree of accuracy is only dependent on the maintenance of a sufficient geographical staff to cope with the material supplied by the Royal Air Force.

In addition to the value of aeroplane photographs for making and correcting of maps, a detailed study of enemy defences is possible, and oblique photographs, especially in broken country, are invaluable. In the attack and capture of Beersheba in 1917 it was reported by a battalion commander that the examination of an oblique photograph of the enemy defences, taken two days before the attack, caused him to alter his position of deployment, with the result that he estimated his battalion was saved over 200 casualties.

3. The enemy will in all probability be tactically extremely mobile.

Here aircraft reconnaissance, giving reports by wireless, telephony, or telegraphy, will prove of the utmost importance when operating against an enemy not equipped with wireless telegraphy, and who can

neither interfere with nor tap messages. Not only will immediate information be given of enemy movements, but bombing machines can be directed to any spot where a suitable target presents itself.

4. The enemy's lines of advance or retreat will in all probability be few in number, and in broken country confined to roads or tracks. This will afford most favourable opportunities for successful attacks by bombing and machine-gun fire from a low height—enemy concentrations will be scattered and transport interrupted.

Where the country is barren, regular attacks by bombing will be made on wells or other sources of water supply throughout the day and night.

Aeroplane photographs will disclose topographical detail which will enable bombing operations to be directed against the most sensitive points of the enemy's communications, such as passes or narrow valleys. The enemy in retreat will be attacked at such points with a view to blocking his way long enough to allow our troops to regain touch or to turn the retreat into a disaster.

In the final operations in Palestine in September, 1918, the advance and enveloping movement of our forces left the Turkish Army with only a single line of retreat running through the broken country in the hills to the north-east of Shechem.

Aeroplane reconnaissance reported the position of the retiring column, and a study of aeroplane photographs enabled a point to be selected for attack where the road ran through a gorge from which there was no escape. At this point the head of the column was attacked and destroyed, completely blocking the road, but, owing to the pressure of our advancing troops in rear, the congestion increased. For a space of four hours attacks by aeroplanes with bombs and machine-guns were continuous, machines in twos and threes being despatched so as to reach their objective at intervals of every three minutes. The result was a scene of appalling carnage, and a striking example of efficacy of aerial attack under suitable conditions. Along a stretch of some five miles of road were found over 100 guns and 800 motor and other vehicles thrown into inextricable confusion.

It has sometimes been suggested that the moral effect of attack from the air decreases with experience, but it is claimed that where such results as this can be obtained, the moral effect must increase with each demonstration. The story of the survivors of such an experience—those, perhaps, who had been wounded and unable to escape from that four hours' continuous attack—would have done much to enhance the moral effect of aircraft had they been able to rejoin their units.

The experience gained in the operations in Afghanistan, and more recently against the frontier tribes, shows beyond doubt that, far from familiarity breeding contempt, the moral effect of the aeroplane has increased with the knowledge of its powers.

In the case of Afghanistan, the single attack by one machine which was carried out on Kabul in May of last year, causing extensive damage to the arsenal, etc., was undoubtedly an important factor in the decision to sue for peace.

5. Operations will usually be carried out at a considerable distance from the base, and with communications liable to interruption, and posts may be isolated and surrounded.

In the case of a force of sufficient size to protect an area large enough for an aeroplane landing ground, the possibilities of supply by air are only limited by the number and type of aircraft available, and it is a perfectly feasible operation for a force to operate supplied entirely by aerial commissariat. With only one or two machines of small carrying capacity much was done in Mesopotamia for the beleaguered garrison of Kut, and in Syria, during the final advance on Aleppo, a cavalry division was enabled to continue the pursuit by receiving supplies of horseshoes and nails by air.

In the case of isolated or surrounded posts examples abound from all theatres of the value of the dropping of ammunition and food and the carriage of despatches and information in conditions where communications are bad or liable to interruption.

6. In addition to the organized attacks by aircraft on ground objectives in conjunction with the general scheme of land operations, it will frequently be the case that purely punitive operations, having as their object the destruction of fortified villages and the burning of crops, can be carried out by aircraft at short notice and in a few hours, whereas the organization and despatch of a military expedition through difficult country might entail weeks of preparation and heavy casualties from sickness if from no other causes.

The value of such operations has been amply demonstrated in various theatres of war, and applies particularly to such countries as Africa, Mesopotamia, and the Indian frontier.

7. The question of co-operation of aircraft with artillery will remain one of the very greatest importance in all operations where it is possible for artillery to be employed—especially in small expeditions in broken country where fleeting opportunities of engaging a target must be seized at once, and economy in the expenditure of ammunition is necessary owing to difficulties of supply.

In some cases rivers navigable for monitors may be available, as was the case in Mesopotamia and North Russia; this, however, is more a question for discussion in considering the naval use of aircraft.

8. A subject which, though perhaps outside the true scope of this paper, is, however, worthy of passing mention, namely, the employment of aircraft in assisting local political authorities to prevent outbreaks which may lead to the inception of active operations.

In Mesopotamia aircraft have afforded most invaluable assistance in this direction, and I would quote certain passages from a report by Lieut.-Colonel A. E. Wilson, Political Officer in Mesopotamia, on this subject. He says: "I have every confidence in the ability of the Royal Air Force to lend powerful aid to the civil power in the maintenance of order in Mesopotamia and North-West Persia *without the intervention of troops* . . .

"Experience shows that effective discrimination can be exercised, and there is less risk of complications on the way to and from the scene of activities and greater moral effect. The attitude of the tribes

is: 'We are not afraid of your troops; guns cannot reach us, but we cannot fight against your aeroplanes.'

". . . . . Aeroplanes could . . . . . generally assist the Government to maintain order at far less cost, and with less military and political liability than troops.

"Our collection of land revenue depends on the maintenance of adequate forces to repress trouble immediately. This has been done hitherto by aeroplanes with very satisfactory results."

It may perhaps also be worth mentioning that photography by aircraft is being successfully employed in Mesopotamia, Egypt, and elsewhere for preparing the estimates for land revenue, the area and nature of crops, etc., and in this way expenditure on aircraft can be made productive in peace time in a way which is not possible in the case of other naval or military expenditure.

9. No attempt has been made in this paper to forecast the ultimate scope for the use of aircraft in military operations, it being my object to outline the main demands which may be made upon aircraft in the immediate future, and the ways in which these demands have been successfully met in the past. But it must be pointed out that the tendency daily is for aeroplanes to increase in efficiency, weight-carrying capacity, and endurance. It has been pointed out that in the past air operations can never be decisive without a military occupation of territory. In the future this objection will be undoubtedly overcome, and, by the employment of numbers of long-distance weight-carrying machines, it will be possible rapidly to despatch large forces to theatres hundreds of miles distant from their base, and to maintain them for as long as may be necessary without any lines of communication whatever on the ground, the guarding of which must inevitably form so serious a drain on the fighting efficiency of the force.

In conclusion, I would like to mention one aspect of the use of aircraft to which it has not been possible to devote sufficient attention in the past, namely, the employment of aircraft as ambulances for the evacuation of wounded. The speed and absence of jolting makes this the ideal method, and in the future it is claimed that many lives will be saved by this means.

Infrequent instances of this have already occurred, notably the evacuation by air of a badly wounded man from an expedition in Central Sinai, who would otherwise have had to travel for three days by camel.

It is sincerely to be hoped that this question will receive the attention it deserves in future operations, and that by this means much suffering and loss of life may be avoided.

DISCUSSION.

DR. MILLER MAGUIRE: It may very much surprise you that an ordinary member of the public and not General Stone or some other officers present who are familiar with the operations of these marvellous machines should dare to propose a vote of thanks to the gallant lecturer for the lecture he has given this afternoon. As no one has risen to discuss the lecture, I ask to be allowed, as one of the civilians of this peaceful island who has a connection with an

adjoining island, to propose a hearty vote of thanks for this wonderful lecture. I call it not so much a vote of thanks as a vote of admiration and astonishment combined with thanks. Here we have a gentleman telling us how to soar right above the world at large, and how he was able to photograph from the air every variety of locality and to make maps which were simply marvellous for the amount of detail they contained. And yet, after all, there is absolutely nothing new in the work, because Chaucer distinctly points out in regard to Central Asia that the Kings of Tartary had horses that used to ride in the air, and our sublime poet, Milton, describes battles in the air—but they were battles between angels and devils. He also sets forth the miracles possible not to aerial photographers like the lecturer, but to people who would dare to fly in the air at all. However, some of Milton's heroes did not fly for long. Satan, for example, ceased his aerial photography at a very early period of his celestial career. I entirely sympathize, like, I am sure, everyone present does, with the lecturer's admirable remarks. I cannot criticize them, I do not know enough; I was too much astonished at what he said. But I do know some of the geography of the regions he has mentioned. I have never been in Mesopotamia, but I have been reading about it since I was a child—about the Syrian kings and such like. I have longed to see the tower of Babel, but I never thought I would do so, and I therefore thank the gallant lecturer most heartily, as I am sure everyone else present does, for the opportunity of seeing a photograph this afternoon of that among other places. I had a letter from an officer who was with General Allenby at Gaza, and I am quite certain from what he said that he was very much indebted indeed to the operations of our aircraft in Palestine. Could I ever stand where Moses stood and have a Pisgah view, I should consider myself up-to-date; and here we have a lecturer to-day who has actually photographed not only where Moses stood but other places of importance in the Holy Land, and he has shown us on a screen in the centre of London Pisgah views, including the Jordan itself! I much prefer to see them in that way than to be in the burning hot valley of the Jordan itself. I will not dwell on the other features of the lecture, because I am only proposing a vote of thanks. I congratulate the young lecturer; I congratulate the country to which he belongs on having such heroes. The gallant officer in the Chair said less than the truth when he pointed out how very much we are indebted to such men in such an age. Here is a gentleman who knows all the aerial courses of the world, and who is master of the situation. He is able to take the part of the Navy in protecting our island; he is able to go to Murmansk in Russia, to Mesopotamia, to the Jordan, to Egypt, and up and down Africa as if such a thing as time and space did not exist! If I go on much longer I shall become enthusiastic, especially in regard to the use of aeroplanes as ambulances. Surely, that was a very fine part of the lecture—to see how our poor soldiers in their agony can be carried half-way up to Heaven—not that they are in a particular hurry to get there—and then be gently deposited at the hospital door. Soldiers of every army would repay at a very large price, far better than any niggardly self-seeking Government would ever think of giving, any officer who did such work. I would myself, and I know that many of my relations who have died in agony would have done the same. I conclude with proposing a vote of thanks and of admiration to the lecturer; and I venture to prophesy that the gallant officer will meet with his deserts in the admiration and the goodwill of his fellow-countrymen, and especially of the gallant soldiers whose exploits from the tower of Babel right away to the Somme Valley he has so brilliantly described.

COLONEL R. A. STEEL, C.M.G., C.I.E.: As an officer of the General Staff during the war, dealing with operations, may I say that, after listening to the

lecture, I wish that not only other General Staff officers dealing with operations, but officers of other branches had been present here this afternoon. What I have heard emphasizes the need that officers of the Army should seize every possible opportunity of learning the views of officers qualified to speak about developments in the Royal Air Force. I had to deal during the earlier stages of the war with those particular theatres of operations in which, had the Air Force been as developed at the time as it was towards the end of the war, it would have been of immense service; I am referring to Mesopotamia, East Africa, and India. I have listened to every word of the lecture with the greatest interest, not only from the point of view of the General Staff, but also from the point of view of an Indian cavalry soldier, who, with the lecturer's father, who is sitting here, was engaged in 1897 in what I may describe as "blindfold" operations on the Indian frontier. As a young officer I had to go ahead practically every day with an officers' patrol. We were working in unmapped country and we did not know what was going on round the corner; we did not know whether the next view would reveal an immense valley or an impassable obstacle of hills and cliffs. The immense benefit of aerial reconnaissance on the north-west frontier of India must be apparent to everybody from the photographs which the lecturer has shown us to-day. One of the photographs taken by the lecturer which was thrown on the screen showed consecutive rugged ridges. It was difficult to tell what the height of the ridges were, but before the lecturer told us that the locality was the Sinai Peninsula, I could almost have sworn that it was the country in which we were operating in 1897. It was a country which was perfectly ridiculous from the point of view of cavalry reconnaissance, and, as a result, we were often badly "had." I venture to think that, in view of the development of aerial reconnaissance, the use of cavalry under such conditions is past. Lastly, not only from the soldier's point of view, but from the more prosaic point of view of the tax-payer, who is also a patriotic Briton, it made one feel extraordinarily hopeful to listen to this lecture because it went to show that, given good organization and sufficient imagination, although practising the economy which is forced upon us, we need not let go by the board any of the more important obligations which we have undertaken.

THE CHAIRMAN: Ladies and Gentlemen. As no one else desires to make any further remarks it only remains for me to thank Colonel Steel for his very apposite remarks. I know that I am voicing the opinion of this meeting when I say that the lecturer could not have brought forward anything more opportune for our consideration than the subject so ably treated in the extremely interesting lecture to which we have listened. Under the eighth heading of the lecturer's skilful summary he dealt with the moral effect of aircraft. In this connection our French allies, who are students of psychology, some years ago in Tonkin went so far as to arrange that at a public festival a pilot should throw handfuls of small coins from his machine zooming over the heads of the *populus*, and afterwards the Governor pointed the moral, that with equal facility an airman in a punitive capacity could hail down death upon their heads. I think we might possibly take a hint from our Allies, and at native festivals in certain countries it might be made a feature for some of our airmen to display what have been termed aerobatics over the heads of the people. I am sure that would have a good effect upon some ignorant Orientals, who are undoubtedly very much impressed by such displays. I remember that in 1912 when the late Marc Pourpe, who met a soldier's death in the war, flew the first aeroplane to Khartoum—it was the same monoplane in which Garros first traversed the Mediterranean—the Arabs were immensely impressed and exclaimed: "We cannot aspire to that,

only your people can do such things." Under the ninth heading in the lecture, the forecast that military expeditions will be conducted with lines of communication in the air, is, I am convinced, not far-fetched. There have been many cases of mails being conveyed by air for the purpose of crossing practically impassable ground such as swamps and impenetrable jungles or waterless deserts, and it is quite conceivable that an expedition might have to be transported by air above such terrain to strike quickly and practically by surprise at an enemy who was hoping to gain time owing to the inaccessibility of our expected lines of approach. We therefore expect and believe that every preparation has been made for carrying out such operations by the Royal Air Force. The lecturer's remarks with regard to mapping from aeroplanes were intensely interesting, particularly to myself, as I have been engaged in surveying in the past, more especially in Egypt under Lord Kitchener. I am quite sure that photography from aeroplanes will revolutionize surveying under active service conditions in wild countries. If anyone in the audience came here to-day doubting the practicability of air operations in small wars above and beyond the acknowledged utility of kite balloons for protective observation, I venture to think that the facts elicited to-day must convince him that proficiency in air fighting is going to be of the very greatest value when operating against forces ill-equipped for aerial warfare. I am quite convinced that everyone present is entirely in agreement with what the lecturer has said, and I therefore ask you to accord a very hearty vote of thanks to Group-Captain Amyas Borton for his valuable and memorable lecture.

The resolution of thanks was then carried by acclamation, and, on the motion of the Secretary (Lieut.-Colonel Sir Arthur Leetham, C.M.G.) a hearty vote of thanks having been accorded to Major-General Sir Nevill Smyth for presiding and for his very valuable remarks, the meeting terminated.

THE GROWTH AND DEVELOPMENT OF THE GERMAN STRATEGIC PLAN.

COMPILED FROM VON KUHL, VON KLUCK, VON BÜLOW, VON HAUSEN, GERMAN GENERAL STAFF PUBLICATIONS, ETC.

VON MOLTKE, the elder, the Chief of the German General Staff, after the crushing of France by superior numbers and the gaining of a strong bridgehead over the Rhine in Alsace and Lorraine, with the fortresses of Strasbourg and Metz, at the conclusion of the Franco-German War in 1871, considered that Germany was strong enough to carry out an offensive campaign on both her eastern and western frontiers simultaneously. The extraordinarily rapid recovery of France, however, soon excluded this possibility from practical strategy, and the first solution of the new problem was to stand on the defensive against Russia and to attack France. As is well known, his advice in 1873 was that this attack should be made at once, before the French Army was entirely reorganized.

With the completion of its reorganization on a national basis, and the rapid construction of the fortifications of the French eastern frontier under the skilful guidance of General Séré des Rivières, it became evident that a rapid decision in the west was no longer possible. Along the 160-mile frontier between Belfort and Longwy there were solid barriers with selected gaps. From Belfort to Epinal there was a strong fortified area, then a gap of 40 miles; then another defended belt between Toul and Verdun, leaving only a narrow passage between the last-named fortress and the Luxembourg—Belgian frontier. Behind this frontier line were the fortresses of Besancon, Langres, Rheims, and in rear again the entrenched camps of Paris and Lyons. Thus an attack on eastern France meant, with the guns of the period, the slow operations of a bombardment, if not of a siege.

After the conclusion of the Alliance with Austro-Hungary in 1879, therefore, von Moltke decided on the offensive against Russia and the defensive against France. If necessary, the German troops were to retire from Alsace and Lorraine on the fortresses of Strasbourg and Mayence, leaving Metz to do the best it could for itself, and the decisive battle would be accepted between Mayence and Frankfort. Should the French attempt to turn the German line through Belgium, they were to be met by an advance from Mayence northwards, so that they would be forced to accept battle facing south in a most unfavourable position, with their backs to the neutral territory of Holland and their communications running to a flank. The offensive against Russia was to be carried out by the Austrians from Eastern Galicia in the direction of Lublin, and by the Germans on the right bank of the

Vistula towards the Narew. The adhesion of Italy to the Austro-German alliance made no difference to the plan, but it was intended to use Italian troops to strengthen the German southern wing in Alsace.

Count Waldersee, who became von Moltke's deputy in 1882 and his successor in 1888, was in agreement with the general principles of obstinate defensive in the west and a rapid offensive in the east that von Moltke had laid down, although in 1886 and 1887, when war with France threatened, operations would naturally have been commenced in the west. He recognized, however, that the final decision must depend on the time of year at which war broke out: a rapid decision in Russia would be difficult in spring and autumn, when the bottom was out of the roads, and it might, therefore, be necessary to send strong forces first to the west.

Count Schlieffen, who succeeded Count Waldersee in 1891, at first followed the same lines as his predecessor. He, however, rejected the plans for the offensive in Russia, regarding the operations against Lublin and the Narew as too widely separated, exposing them to the danger of an attack in flank, or to becoming mere blows in the air, if the Russians chose to slip back. He therefore proposed an advance of the Germans from Upper Silesia and South Poland against the Vistula above Ivangorod, and of the Austrians from West Galicia.

As time went on, the armies of the great continental Powers increased in size, and with them the space required for their deployment. The positions selected by von Moltke in Lorraine and on the Main were no longer suitable. The defence in Lorraine, indeed, was dangerous, for the scheme of meeting a French turning movement through Belgium by an advance northwards might not be feasible: the French would have enough men to combine their envelopment with a frontal attack on the forces in Lorraine, and might pin them there. Weather also might bring an offensive in the east to an unexpected end. It therefore appeared better from every point of view to seek the decision in the west and confine operations in the east to the defensive.

An attack on the French eastern fortifications, even if it was successful beyond all expectations, would, it was considered, take an exceedingly long time. From the military point of view, it was imperative that they should be turned. And thus came the decision that the German Army must go through Belgium.

Originally the turning movement was combined with a frontal attack, but as time went on the force to be employed on the turning wing was gradually made stronger, and the scope of the movement made wider. The frontal attack dropped out, the force in Lorraine was reduced gradually to smaller and smaller dimensions and assigned defensive duties only. Every effort was made to increase the mass of the armies, which, pivoting on the fortified area Metz—Thionville, was to carry out the great envelopment and wheel through Belgium and Northern France, and turn and roll up the French defensive lines.

When after the Russo-Japanese War, Russia was so weak that Germany for a time need give little attention to her eastern neighbour and her forces could be employed practically exclusively in the west,

the General Staff plans assigned to the attack north of Metz—Thionville not less than 35½ corps, active and reserve, eight cavalry divisions and 16 Landwehr brigades, of which nearly a half were eventually to be employed beyond the Sambre and Meuse. In Alsace and Lorraine were left, in addition to the fortress garrisons, only 4½ corps, 3 cavalry divisions and the local Landwehr brigades. And from these two corps were to be withdrawn as soon as possible and added to the offensive wing, which would thus be increased to 37½ corps.

The whole plan of attack on France depended on the right wing being made as strong as possible. Owing to the partial recovery of Russia from the effects of the Manchurian War, when Germany chose her time in 1914 to put the plan into execution, three active corps, and one and a half reserve corps, one Ersatz corps, total 5½ corps with a cavalry division besides Landwehr formations, were allotted to the defence of the eastern frontier. Before August was out, owing to the fear for the inhabitants of East Prussia, they were reinforced by two more corps (XI Active and Guard Reserve) and a cavalry division, taken on the fall of Namur from the western force, and from its striking wing. This left for the great movement on Paris 21 active corps, 14 reserve corps (counting two independent divisions as one corps) and six Ersatz divisions—say 38 corps in seven armies, with nine cavalry divisions. Of these no less than 11½ corps and two cavalry divisions were in the Sixth and Seventh Armies on the defensive in Alsace and Lorraine, leaving only 26½ corps and seven cavalry divisions for the striking force north of Thionville. This might have sufficed at manœuvres, but the German General Staff seems to have forgotten the factor of losses, for by the time the battle of the Marne was over, the First, Second and Third Armies, we know from published statements, were down to half their original strength; and they had further—no doubt another neglected factor in the German calculations—been completely out-manœuvred and out-fought. And, as an arm-chair critic, one may go as far as to say that at the last moment the Germans seem to have taken counsel with their fears, and neglected the first principle of strategy, "make your detachments as small as possible." For they made their defensive forces in Alsace and Lorraine and on the eastern frontier far stronger than in their paper plans, and thus fortunately for us fatally maimed their mass of attack on the right flank.

THE GROWTH AND DEVELOPMENT OF THE FRENCH STRATEGIC PLAN OF CONCENTRATION.

COMPILED FROM WORKS OF GENERALS PALAT, THOMASSON, MAITROT, BERTHAUT, MM. VICTOR MARGUERITTE, HANOTAUX, etc.

A SUCCESSION of plans of concentration against Germany preceded Plan No. 17, the one which came officially into force in April, 1914, and placed the whole of the available French forces facing east, with the significant title of the *Armée de l'Est*. It is unnecessary to allude to all of them, as some were mere variants, and it will be sufficient to summarize the more important.

No. 1 was dated 1875, and was dependent on the system of fortifications of the Eastern frontier devised by General Séré de Rivières, and already described.[1] Plan No. 1 therefore arranged for the concentration of four small armies between Vesoul and Langres, that is, behind the southern group of fortifications, facing north-east, with the whole of the south of France behind them for manœuvre if necessary, but with a view to taking the counter-offensive northward or west of north, should the Germans force the gaps, or to falling on them whilst engaged against the fortresses.

Plan No. 4 of 1878 took into account for the first time an attack through Belgium, on the *right* bank of the Meuse; and one army of two corps was detailed to face the northern frontier.

Plan No. 11 of 1891 moved the main army northwards, so that Toul became nearly the centre of the concentration area.

Plan No. 14 of 1898 contained the strategic advanced guard idea. It arranged five armies in three lines, with one army in the first, three in the second and one in the third line. They were to be composed of active troops only, reserve formations were for the first time excluded from participation in the first shock. Three groups of reserve divisions were, however, provided, but quite separate from the armies of attack, and to be assembled much in the rear of them.

Plan No. 15 of 1903 suppressed the strategic advanced guard and only kept two lines. It was entirely defensive, and contemplated the abandonment of Nancy. A variant, Plan No. 15 *bis*, modified the concentration slightly and provided for coast defence.

Plan No. 16 contained considerable alterations, occasioned by the bringing into force of the Two-Years' Service Law, and by the change in the relations with Great Britain, which freed France to a large extent of any anxiety about her coasts. Six armies were assembled in two lines. In first line were two armies of four to five corps each, opposite Nancy—Verdun; and in the second line, from Dôle to the Argonne,

[1] See page 320 of this issue.

three armies of two corps each. In echelon, well behind the left, was to be a sixth army, composed of four corps and some reserve divisions, covering the road Chalons—Paris. Thus the probability of the violation of Belgian territory by the enemy was further recognized, and the centre of gravity of the forces was shifted further north, and the idea of the counter-offensive against the enemy's right was accentuated.

In 1910 General Michel became Chief of the General Staff of the Army and *généralissime* elect. He appears, from the evidence given before the *Commission d'Enquête* on the conduct of the war, to have thoroughly realized the danger confronting his country He was convinced that the German main attack would not come either through Lorraine or Belgium south of the line formed by the Sambre and Meuse, where a rapid and effective decision could hardly be expected, but through Belgium west of the Meuse; and that the German General Staff would not hesitate to employ the bulk of their forces on that wing, not only to outflank the fortifications of the east frontier, but to deal a decisive blow. There were plenty of signs of this. Amongst others, since 1904 many old railway lines had been doubled and new ones constructed in the Rhine provinces, particularly in the Eifel, and connected with the Westphalian and even the Belgian railway systems. Huge stations had been built, which stood empty and deserted, obviously designed for nothing except military traffic. A little later the Prussian *Landtag* voted 452 millions of marks to improve the railway system between the Rhine, Treves and Luxembourg.

In June, 1911, therefore, when the Agadir crisis was reaching its height, General Michel put forward his plan for large modifications in the mobilization and concentration of the armies. He proposed a principal mass of attack, 490,000 men, assembled on a front between the line of the Sambre and Meuse (say, between Maubeuge and Dunkerque); another mass to defend the eastern frontier, covering about double the front of the first; and a third mass, of about 222,000 men, available for use as required, assembled covering Paris. To obtain the men necessary for this scheme, General Michel proposed, by reorganizing the reserve, to double the infantry in all the active formations. Each regiment was to mobilize a reserve regiment, and the two were to form a brigade under the Colonel. Each active brigade was to become a division, and each active division a corps, duly provided with heavy artillery.

The suggested employment of reserve formations, "which only existed on paper and lacked cohesion, were badly commanded and had N.C.O.'s who were far from satisfactory," alarmed the politicians. The reservist—an elector—had grown to consider himself almost clear of the Army, he was doing his duty in another way as a *père de famille*. The political considerations referred to in the last paragraph of this summary, no doubt, also had their weight. In any case, General Michel was got rid of[1] and General Joffre appointed in his place, after

[1] It is interesting to recall that von Ludendorff lost his appointment in the Operations Branch in 1913 because he wanted three extra corps. Thus neither opponent would spend the money required to ensure safety: the ship of State was risked for a ha'porth of tar.

General Galliéni had declined it on the grounds that his experience had been principally colonial. As the new *généralissime* had had little general staff experience, General de Castelnau was appointed his assistant.

Plan No. 16 *bis* was then elaborated. It is said to have been the joint work of Generals Dubail and Castelnau. It assumed, like its predecessors, a limited invasion of Belgium, and for the first time, the possible assistance of a British force. As regards Plan No. 16 *ter*, no information is available.

Plan No. 17, on which the campaign was opened, was settled in the spring of 1913 and came into force in April, 1914. According to this plan, the French formed on mobilization five armies and a cavalry corps of three divisions, besides seven cavalry divisions allotted to armies. The reserve divisions available were grouped in twos and threes and detailed to special tasks outside the armies, or kept at the disposal of G.Q.G. (Grand Quartier Général). The armies were concentrated with four armies in the front line and one behind the left, facing the frontier between Switzerland and Luxembourg, in detail as under:—

First Army (General Dubail): Region of Epinal.

Second Army (General de Castelnau): Region of Nancy.

Third Army (General Ruffey): Region of Verdun.

Fifth Army (General Lanrezac): Between Verdun (exclusive) and Mezieres, with one corps and a cavalry division east of the Meuse.

Fourth Army (General de Langle de Cary): In second line in the region Ste. Menehould—Commercy.

Reserve divisions on the front: A group on either flank of the main concentration—four in the region of Belfort; three in the region of Hirson and Vervins.

The political necessity of not committing any act that would give Germany an excuse for entering Belgium, had no doubt a great influence on the selection of the ground for the initial deployment, and the abstention from placing troops opposite the Belgian frontier. Further, the fortresses on the north-eastern frontier, e.g., Maubeuge, Valenciennes, Lille, had been neglected and practically declassed, the armament withdrawn and ammunition reserves removed. In order to prevent any chance of provocation, when relations became strained, all troops were withdrawn from the zone within 10 kilometres of the frontier. France was determined to go into the war with clean hands. How far her plan of concentration and offensive depended on the operations of the Russians has not yet been disclosed.

THE MILITARY EDUCATION OF TRAINED OFFICERS NOW IN THE COUNTRY BUT OUTSIDE THE REGULAR ARMY.

By Lieut.-Colonel J. C. Dundas, D.S.O., R.A.

General.

1. THERE are in this country at the present time a very large number of men who have served as officers in the war but who have since been demobilized whose war experience and military knowledge, if kept up to date and extended, would prove of inestimable value to the army in a future emergency.

Having in view the great difficulty experienced in obtaining officers of any experience in the early stages of the past war and the delay in training the New Armies which resulted therefrom, it seems almost criminal to neglect any possible opportunity of preventing the recurrence of a similar situation in the future, especially in these days when our heavy commitments abroad and the unsettled state of the world point to the probability of our having before long to undertake minor operations or punitive expeditions on a scale which would necessitate the employment of forces greater than those which the Regular Army could furnish unaided.

The following article has therefore been written with a view to drawing attention to the problem, and suggesting a possible method of dealing with it under existing conditions.

Preliminary Assumptions.

2. In approaching the subject three preliminary assumptions must be made :—

(*a*) That the organization and conditions of service in the recently recreated Territorial Army and Special Reserve must remain similar to those of pre-war days, except in certain matters of detail which have been announced.

(*b*) That the state of the national finances will not admit of any serious increase in expenditure in connection with training or building.

(*c*) That no form of compulsion will be tolerated.

Classes of Men to be Considered.

3. The men with whose education this paper deals come under two categories :—

(*a*) Officers who continue to hold commissions in the Territorial Army or Special Reserve.

(*b*) Those who on demobilization have severed all connection with the Service.

In the case of the former full records are available as to their location ; they are under a certain measure of control, in that they hold commissions and enter into certain obligations as to performance of drills, etc. ; and, what is more important, they are bound to the Service and each other by ties of comradeship and *esprit de corps.*

With the latter all touch is lost on demobilization ; moreover, it may generally speaking be assumed that, since they have not joined the Territorial Army or Special Reserve, either owing to stress of business or disinclination, no pressure which could reasonably be brought to bear under existing political conditions would induce them to accept direct liability to military service in time of peace. It will therefore only be possible to carry out their military education by indirect methods.

In this case, before any system of education can be brought into being, it will first be necessary to regain touch with them and to induce them to register themselves by inviting them either to join a Reserve of Officers which incurs no peace-time obligations or to become members of a military society such as is outlined in paragraph 7 below. Of the two alternatives, the latter appears the more promising, having regard to the psychology and position in life of the classes from which the bulk of these officers was originally drawn.

Forms of Military Education Required.

3. In considering the question of military education it must be remembered that it is not only with tactical and technical matters that we have to deal, but also with those subjects, including administration, command and the like, with which the moral of troops is so closely bound up.

Both these branches of education can to a greater or lesser degree be taught theoretically by lecture, staff tour or similar methods, but practical experience with troops can never be wholly dispensed with. Experience with the Territorial Force in pre-war days taught the writer how much greater were the defects of officers in " moral " training than in matters of drill,[1] and further how difficult it was to instil a knowledge of military administration and kindred subjects except by the practical example of the Regular Army.

Although this defect will not be so apparent in officers who have served in theatres of war, yet experience tends to show that the war standard, especially amongst junior officers, often fell short of what is desirable, or would have been considered essential in pre-war days.

For these and many other reasons practical experience with troops must form part of the continued education of those officers whom we are considering.

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[1] That this was so, was due to no fault of the officers but simply to the lack of opportunity of gaining experience in this branch of their duty.

Opportunities for Military Education.

4. The opportunities of officers outside the Regular Army for improving their military knowledge are not to be measured, if we may judge by the example of the pre-war Territorial Force, by the willingness of individuals to attend, but rather by the attitude taken up by employers. The hours normally available (outside the annual fortnight's holiday) are evenings after work and Saturday afternoons. Many Territorial officers in the past have willingly given the bulk of their leisure hours to military training and will doubtless do so in the future, but men who have completely severed their connection with the Service are unlikely to feel the same obligation or inclination to do so unless some concomitant inducements are offered. Time over and above that specified can only be obtained at the expense of civil employment. Some employers are generous in granting facilities, others the reverse. Some men who are their own employers forfeit gain to perform military duties, exhibiting thereby a self-sacrifice little appreciated before the war and likely again to be forgotten now that it is over. The net result is this: appeals to employers voluntarily to give employés additional facilities for attending military training at the expense of their civil duties only cause the generous and patriotic to suffer.

Short, therefore, of passing an Act of Parliament compelling all employers alike to give certain facilities to men desirous of attending military training, a Utopian proposition at the present time, we must accept the opportunities stated above as the maximum likely to be available.

Practical Training.

5. Practical training may be carried out either in the form of attachment to regular units or courses of instruction in special subjects, such as musketry, signalling, etc. The amount of such training that can be carried out is limited by financial considerations (since it is essential that officers attending should not be out of pocket) and also by the time officers can spare for the purpose. The amount of training which can be carried out in any year under these limitations may be slightly increased if facilities can be provided as near the officers' homes as possible.

In the past the knowledge acquired by officers attached to regular units or attending courses, especially in the former case, varied enormously according as the C.O. or instructor took pains to teach or the reverse. In the future this point should be of far less importance, for the spirit of cameraderie induced between Regulars and Territorials by the war and the realization by the regular officer of the fact that the efficiency of the army as a whole is dependent on the sound training given to non-regular officers, should ensure that every regular officer will do his utmost to assist his non-regular comrades. Even so, it will probably be advisable to select units whose commanders are specially suitable to carry out the training of officers attached from the Territorial Army, Special Reserve, or other sources referred to below.

As regards practical education generally, it may be stated:—

(1) That no increased opportunities are likely to be available.

(2) That past systems are suitable, if adequate supervision is given by the General Staff, to ensure that full use is made of the opportunities available.

(3) That ex-officers who are members of the military societies referred to in paragraph 7 below should be permitted to attend on the same footing as officers of the Territorial Army or Special Reserve.

Theoretical Training.

6. If there is little hope of increased opportunity for practical training with troops, there seems no reason why, if the question is taken up in a broad-minded and energetic manner by the State, a great deal should not be done in the way of theoretical education.

In the past theoretical training and general military education of Territorial officers was carried out in a somewhat haphazard fashion. Adjutants were regarded as the instructors of their units in all matters military. They, though probably excellent drill instructors and possibly tacticians, were by no means always qualified to instruct officers in the many other subjects which should form part of an officer's military education. Officers were encouraged to enter for the regular army promotion examinations, involving a study (without the assistance of competent instructors) of a limited amount of military history, strategy, tactics, administration, and law—subjects generally "crammed" for examination purposes only. Few, however, availed themselves of the opportunity.

Such methods cannot but fail in the future if applied to the higher education of officers who have had war experience.

Those officers whom we are considering must not only be afforded a high standard of instruction, but must also be offered some inducement to surrender their leisure hours to military study. The mere knowledge that they are increasing their military value to their country will attract a few, but not the great mass of Territorial or Special Reserve officers, and still less those who have left the Service.

It remains, therefore, to consider what inducements can be offered within existing limits of finance and opportunity.

First. Educational.—If in addition to increasing their military knowledge, officers could be afforded opportunities of improving their general education, widening their outlook, and acquiring information of interest or value to them in their civil careers or everyday life, many would combine the two objects who would take no interest in military training alone. That such is a fact is proved by the educational value of many clubs in varying strata of society, from the public school boys' debating society or the literary clubs of the west end of London to the working men's clubs in the slums of the large towns.

Second. Social.—By combining social amenities of club life with military training men will similarly be drawn together, cameraderie established, and a body of opinion created on which military education can be grafted. The truth of this is borne out by the experience of the Territorial Force.

Third. Financial.—Under present conditions little assistance can be expected from public funds under this head, but a scheme is outlined in paragraph 7 which, with little cost to the country, would do a good deal to forward the cause of military education.

Keeping in mind the considerations outlined in the preceding pages, a definite proposal for the continued military education of officers and ex-officers outside the Regular Army is outlined in the next paragraph.

If (and only if) the scheme is well organized, strongly supported by higher authority, and backed by a high standard of instruction and energetic management, it seems possible that it might find favour with those for whose benefit it is intended. On its finding favour will depend its success.

Organization of Military Societies.

7. The outline of the suggested scheme is as follows :—

(*a*) In each command an officers' military society will be formed. Such societies will be administered in the War Office by the Director of Staff Duties, and in each command by a specially selected General Staff Officer who will be responsible to the G.O.C. in C of the Command for its management.

(*b*) Branches of the Command military society will be formed in the larger towns in the Command, and as time goes on it may prove practicable to form others in the smaller towns and larger villages where Territorial Army Headquarters exist. The nearer the branches can be brought to officers' homes, consistently with a satisfactory standard of instruction being given, the greater will be their value.

(*c*) Command societies and their branches will be managed by locally elected committees, in whom funds will be vested, and who will be entirely responsible for the social aspects of the society.

Committees, in conjunction with the General Staff Officer at Command Headquarters, with whom they will correspond direct, will arrange syllabus of instruction, lectures, exercises of a military nature, etc. Committees will be at liberty themselves to arrange non-military lectures, debates, etc., on any non-political subject, or may invoke the assistance of the General Staff.

In view of the correspondence involved it may well be found convenient in some cases to appoint a local territorial adjutant as secretary of the committee.

(*d*) Club buildings for branches should be provided by T.F. Associations. Little, if any, building would be required, as in most

places arrangements could be made to set aside a portion of some Territorial Army Headquarters. In certain cases regular military buildings could be utilized.

(*e*) All regular and territorial or special reserve officers, and all ex-officers should be elegible for membership. At first little or no subscription should be charged, but later it might be found possible to raise the subscription to, say, £1 per annum, thereby materially increasing the scope of the club without creating a charge on public funds.

(*f*) The educational aspects of the club will be catered for as follows :—

Military.—Lectures, debates, war games in the evenings, and local regimental tours on Saturdays will be arranged by the General Staff in conjunction with the committee. A library of useful standard works should be provided and maintained at the public expense.

General.—Debates will be arranged and lectures provided either by members or by outside lecturers on matters of general interest, commercial, literary, exploration, travel, etc., etc. A library of useful books dealing with such matters should also be provided. The lending library system might be introduced for this purpose, interchange being carried out between commands and branches.

In regard to the educational aspect the following points are of the utmost importance :—

(i) The standard of lectures and instruction must be well maintained. A small amount of money spent on this will amply repay itself. Close touch between the societies and universities and similar educational institutions will materially assist in providing a really high standard of instruction, especially in non-military subjects.

War Office and Commands must lay themselves out to achieve this end, for a succession of dull lectures or badly organized debates or exercises will kill all interest very rapidly, especially in early days.

(ii) There must be an entire absence of " red tape " in dealing with these societies, which should not be regarded as military units, but rather as the personal protégés of the G.S.O.'s appointed to administer them. On the latter will fall the burden of the work connected with the scheme in their Command, and with them will rest its failure or success.

(*g*) The social aspect will be managed entirely by the local committee. The existence of a comfortable smoking room, where members can meet, will be something. If a mess, such as existed in many T.F. Units' headquarters, and a billiard room and library can also be provided, so much the better. Dances, concerts and the like there will certainly be no difficulty in arranging as in the T.F. in pre-war days.

(*h*) *Lastly.* As regards the financial aspect, it is for consideration whether, even with the limited funds available, some form of annual

military scholarship could not be awarded to members of military societies who attained the highest standard in the course of military instruction carried out by the society during the year.

There is no space to enter into details, but even if scholarships were small in value, say three of £50, £30, £20 in each Command per annum, such bonuses would, at a total cost to the public of £600 per annum, encourage all members to improve their military knowledge, would be of material assistance to poor men in their professions, and pleasant pocket money to those who were well off.

Conclusion.

Such is a possible scheme to deal with what appears to the writer to be a matter of vital importance to the country and the army at the present time, and one which will admit of little delay in dealing with it. Many far better solutions to the problem can doubtless be suggested; but if it raises a discussion on the subject, this paper will have served its purpose.

MILITARY TRAINING IN THE FUTURE.

By Lieut.-Colonel C. G. Higgins, C.M.G., D.S.O.

"The principal aim of field fortification is to enable the soldier to use his weapons with the greatest effect, the second to protect him against the adversary's fire. By thus reducing losses and increasing the powers of resistance in any part of the theatre of operations or field of battle, more troops are available to swell the force destined for decisive action there or elsewhere."—M.M.E., Chapter I.

A LARGE number of wise people say that there will not be another war in the lives of the present generation of soldiers.

Others, perhaps equally wise, say that there will be; whichever view we take ourselves, as a regular Army is still going to exist, we shall admit that it must be trained.

We know that education in civil subjects is going in the future to take up a large part of the time allotted to soldiers for training, and very rightly so.

There will be consequently less time allowed us to spend on training the soldier in his military duties and subjects.

It would appear, therefore, to be only sensible to devote this time to teaching essentials and to cast our minds back to the daily happenings of the war and to the lessons they taught us.

We can then come to a conclusion as to what particular subjects it is necessary to devote time to in the future in the individual training of a soldier.

It is well to admit if you wish to improve that you are not perfect.

What, therefore, were the weakest points in the individual soldier's military knowledge or training, which the war disclosed daily to those who have eyes to see, and which could be remedied in the future by better and more instruction than was given to them in the past?

Was it in discipline, musketry, march or manœuvring power or what? In none of them. I say without any hesitation, and I believe the vast majority of soldiers will agree with me, when I say it, that the chief weakness of the British soldier lay in his almost complete ignorance of the principles and practices of the more elementary forms of field engineering; a fact which affected his own and other people's lives daily, not only in the days of great battles, but in normal times in the trenches, and even far behind them.

By elementary field engineering I mean a knowledge of the proper construction of trenches, all forms of trench shelters; protected sap-heads, and look-out posts, company headquarters, latrines, etc.—all capable of resisting the weather and the lighter type of field guns. This should be within the scope of all infantry battalions without having to call upon outside aid.

The construction of mined dugouts and command posts capable of withstanding the effects of the heavier types of guns is another question altogether. If ever a war has been fought when this knowledge would have been invaluable both in the matter of saving lives from fire and sickness, it was during the recent one.

How many countless hours were not wasted in the construction of various forms of trench shelters, traverses, look-out posts, etc., which obviously could never hope to survive the arrival of one "whizz-bang" or one thunderstorm?

How many valuable lives were not lost whilst performing the daily calls of nature in a so-called protected latrine, lives which never need have been sacrificed had a little more knowledge been possessed by those who had constructed them?

Why did the popular war humorist always depict company headquarters as consisting of a couple of sand bags and a sheet of corrugated iron? Because he had lived in them, thus.

I do not wish to contend here that a knowledge of field engineering will enable you to win a war, but it will save many thousands of lives and accordingly give you a better chance to do so.

What does the text book say?

The high moral of men living in good clean-cut and deep trenches with properly constructed living accommodation as compared with that of men cowering in shallow insanitary ones with no proper weather-proof accommodation cannot be exaggerated.

Nor are the first-named less willing to leave their trenches to attack the enemy. On the contrary, it is those who have been living under the bad conditions whose offensive spirit has gone. And it is not only trenches in the immediate vicinity of the enemy we have to consider.

Thousands of men actually doing periods of repose have to be "billeted" in trenches miles behind the line in modern war.

For if the reserve lines are not occupied they quickly go out of repair. Further, it is not possible to provide accommodation above ground for the gigantic size of modern armies, nor is it even desirable to do so with the ever-increasing employment of bombing by aircraft.

Trenches, therefore, are necessary not only to fight from but to live in as billets. They have become the infantry soldiers' home in war.

Is it possible, therefore, to learn too much as to the best method of constructing them?

Is there anyone who will dispute that in future wars we shall not go to ground again?

Will not the ever-increasing use of aircraft make this more and more necessary, not only for purposes of protection but for purposes of concealment? If we admit this, it is our duty to learn how to take better advantage of the earth than we knew how to, either at the beginning or at the end of the war.

For by so doing we shall save lives—thousands of lives—hundreds of thousands, perhaps.

And then we come to the question of wire. It, no more than trenches, can win a war, but it can enormously prolong one. It can cause your enemy immense casualties, it can make him expend vast quantities of ammunition in his endeavours to cut it and divert human energy and material from other things in his efforts to find a solution for overcoming it.

Who would dare to estimate the number of casualties caused to us by enemy wire? What countless tragedies were not enacted in its toils, what failures in attack was it not the cause of before the final supremacy of the tank? How many tons of ammunition have not been hurled at it, only to find at the end of this vast expenditure that it was still unsurpassable by the bravest of troops after sanguinary losses? Does anyone wish to contend that we had conceived its possibilities or trained troops sufficiently in the best method of its construction or destruction?

Were troops trained in peace time to erect it at night?—the only true test.

The importance of some knowledge of the more simple forms of drainage is also very great. For you cannot have good trenches unless they are properly drained. If you sit in water-logged trenches while the enemy opposite you is occupying dry ones, then he has a military, material, and moral advantage over you.

We must by training junior infantry officers and the rank and file in peace time in these subjects more fully than we have done in the past, eliminate the eternal cry for the sapper in war time.

What did the training of the rank and file in these subjects amount to previous to the war?—very little. A very few days in the course of the annual company training, and then the subject was dismissed with a sigh of relief till the following year. How were the principles of drainage taught?

Some sunny July day, probably at the end of a morning's digging, a hasty scratch would be made previous to falling out, and labelled a drain.

Did the author of it, haunted by a morbid curiosity, ever return on a wet day to the scene of his crime, to see if it was answering the purpose for which it had been made? Never!

Some wandering sheep or goat was probably the only living creature who ever had sufficient curiosity to inspect this particular piece of futility.

It was curious, too, how the mere mention of the word tape in the war positively made many junior commanders blanch.

They could not have evinced greater surprise had you asked them to handle some extremely dangerous and naked explosive.

A tape according to their views was an article strictly the property of the Royal Engineers and should be handled by none other than these scientific troops.

Then there are the cardinal sins such as under cutting traverses, making cubby holes along the wall of the trench and many others which need to be stamped out as ruthlessly as venereal desease.

These points should be constantly brought out at lectures and the evils they lead to demonstrated in practice.

It is granted that much of the work done on trenches was liable to turn you into a sad and disappointed man. For it came to be an understood thing that what one unit put up the next one pulled down, what one dug out the other filled in. And the gods above looked on and smiled. It was a long war and we must have our amusements. There did not often appear to be any policy of continuity for the fortification of the various sectors. There were exceptions, of course. Some corps and divisions had a defined policy for the gradual improvement of the system they were responsible for, which policy succeeding reliefs had to adhere to, and of course we all belonged to or commanded these particular corps or divisions, so no one can be offended, otherwise I should not dare write thus.

However, before you can dig you must have tools to do so. I do not know if the scale of tools carried by a battalion was fixed on for the purpose of framing questions in examination papers. The scale would certainly never be chosen by a man who was responsible for entrenching his battalion against an attack by a living enemy. Nevertheless, the tool limbers drag their weary length in the wake of the column and when work must be done the cry goes up for tools to be sent forward urgently by lorry.

But then there is the entrenching tool carried by the man. It has been truly said that war finds a use for everything and the particular use of this article was found to be that of opening and breaking up ration boxes.

Some one, I know, has dug magnificent trenches with his battalion entrenching tools. Others, not so fortunate, have had to take them over.

However, they have been allotted to us so we must take them with us.

Anything that has been allotted to you, you must use.

I remember one day during the course of a tactical exercise on outpost duties held behind the lines in France an officer being asked why he had put his cavalry out on outpost duty at night—the old, old catch—and he replied, "Well, sir, they were allotted to me, so I thought I must use them."

A friend of mine sitting next to me accurately remarked to me aside, "Yes, and if he had been allotted baths as well that day, he'd have used them too." He would have, there is no doubt.

It is a state of mentality you have to reckon with in the army and it succeeds, too, very often. Never, it is true, against a living enemy, but in times of peace. And that it is what really matters after all.

But to return to the subject of field engineering. What is the remedy for the defects we have noted, if we believe they exist? It must be more individual instruction and training in these subjects than has existed in the past. Whether it should take the form of garrison classes for officers and N.C.O.'s; whether an R.E. officer should be permanently attached to an infantry battalion for instructional purposes

matters not here. The machinery is simple to find once the need is admitted.

In war a resolute commander and one gifted with some power of organization can do a great deal. He can by his own personality and example inspire his troops to attack or defend to the limit of their powers. But he cannot train troops without previous knowledge to become proficient in the subjects we have been discussing, at least, only after some very considerable time and then by hasty and improvised methods. In the meantime lives are being lost daily. Lives are being sacrificed for no purpose and because previous training has been at fault. That is the point.

The motto of the infantry soldier should be, "Dig, Dig Hard, Dig Deep," for by so doing he will save his own life and what is better still and more important, win the battle.

A NOTE ON THE MILITARY ORGANIZATION OF IMPERIAL DEFENCE.

By MAJOR-GENERAL W. D. BIRD, C.B., C.M.G., D.S.O.

"For if the trumpet give an uncertain sound, who shall prepare him for the battle?"—I. Cor., xiv., 8.

"WAR," said Napier, "tries the strength of the military framework; it is in peace that the framework itself is formed."

Although it may justly be claimed that the British Empire has emerged in complete triumph from a contest fought out on the largest possible scale, it can hardly be pretended that the organization of Imperial defence is not now in need of careful reconsideration, for the war disclosed serious defects in the defensive framework of the Empire as well as astonishing strength and elasticity.

Men learn most easily from their mistakes, and the weakness of our fighting organization can, therefore, best be illustrated from the campaign in Mesopotamia.

"When war broke out in 1914 there were"—as is pointed out in the report made by the Mesopotamia Commission in 1917—"in the British Empire two great military administrative organizations—one in England, the other in India at Simla. In our self-governing Dominions such as Canada, Australasia, New Zealand, and South Africa there were self-supporting local forces under the control of their respective Governments. But the War Office in London and the military departments in Simla were the only complete military organizations equipped for the planning, despatch, control, and supply of expeditions beyond their respective territories over the sea." Under a curious expedient, also "Asia was divided between the Imperial and Indian Intelligence Departments . . . . . a line was drawn through Arabia from Akaba to Basra, all north of that line belonging to Whitehall, all south to Simla. Basra was thus given to India, Mesopotamia to Great Britain—a somewhat confused division of responsibility, inasmuch as Basra must inevitably become the base of any operations in Mesopotamia from the Persian Gulf." Further, the following authorities had to be consulted as regards the Mesopotamian Expedition: "First, the General Officer Commanding on the spot in Mesopotamia, then the Viceroy, then the Secretary of State for India with his Military Secretary, then the War Council with the Imperial Staff, and finally the Cabinet." And it may be observed that, owing to the absence of centralization of responsibility, no one of these authorities was, at the critical period of the campaign in 1915, in full possession of the facts necessary for the formation of a just

conclusion. The local Commander necessarily was unaware as to the general strategical position, and as to the situation in regard to man-power, material, and shipping. The Government of India was largely in the same condition, and, further, was not adequately informed as to the requirements of the force in Mesopotamia in the vital matter of transport. The India Office was not fully acquainted with the strategical position in other theatres of war, and as to the questions of man-power, material, and shipping; and the War Office was to a great extent ignorant of the local difficulties in Mesopotamia. This unfortunate subdivision of responsibility, moreover, seems still to exist, for quite recently it was pointed out in the House of Commons[1] that, "the naval policy of the Red Sea from Suez down to Aden is under the Commander-in-Chief of the East Indies, who takes his directions from Simla; and down the Red Sea the military take their instructions from the War Office."

Close co-operation between all the parties concerned in the defence of the Empire is admittedly essential if successful war is to be carried on, but it is at least a question whether "the very gods themselves" could continue to co-operate successfully under modern conditions on these terms! The disease, therefore, is easily ascertained, there is an absence in our military arrangements of such means of co-ordination as will be effective in the future. And since it is certain that the first element of success in war, and of efficiency in the preparations for war, is that every problem should be considered by a central authority which is in possession of all the data necessary for the formation of a sound opinion, this lack of the means of co-ordination may prove to be a serious danger. The problem, then, is to prescribe a remedy.

It has been said that a State which has not the right of control over its armed forces is, in fact, no longer a State. The people of the States that are comprised within the British Empire appear, and not unnaturally, to attach the highest importance to the retention of the fullest control over the forces provided locally for Imperial defence; and it is, therefore, probably out of the question to hope that they may cede this portion of their responsibility to some central authority, as is done in the case of the United States of America. Some less simple means of co-ordination is consequently required.

Under modern conditions the problems of war and of preparation for war affect every department of the Imperial States. On the military side there are few British operations which do not involve combined action by the Naval, Military, and Air forces. From the civil aspect finance, man-power, health, transportation, and production must all be considered, as well as minor matters that affect the liberty of the subject. The means of co-ordination, therefore, must be in the hands of the Governments concerned, who in peace will probably rely on correspondence, either directly or through a High Commissioner, and on periodical meetings for this purpose; and in war may construct some form of combined War Cabinet, as was done during the recent war.

[1] March 22nd, 1920.

The question now arises as to the co-ordination of the work of the authorities, naval, military, and aerial, who are to advise the War Cabinet during periods of conflict, and the various Governments in times of peace, as to the military measures necessary for the security of the Empire.

At present the machinery for the co-ordination of expert opinion in regard to the military problems of Imperial defence, complicated as these are by our obligations under the covenant of the League of Nations, is as follows: In the United Kingdom the three fighting services are controlled by two Ministers; and, apart from formal correspondence and from any informal relations that may be established between the British naval, military, and air staffs, and between these staffs and those in India and the Dominions, the technical experts apparently can come together to discuss and reconcile their views only at the periodical assembly of an Imperial Conference, or so far as the United Kingdom and India are concerned, at the more frequent meetings of the Committee of Imperial Defence. The latter, however, is described as "really nothing more than a Secretariat of the Prime Minister," to which are summoned by the Prime Minister, as required, Ministers, experts and others whose opinions are considered of consequence in regard to the particular problem of defence which is under consideration.

Whatever may be the value of this Committee as a means of promoting discussion in time of peace, it does not appear to have provided a satisfactory method of enabling the military problems of Imperial defence to be considered in a comprehensive spirit. It has been stated[1] that the naval and military experts often sat and suffered at its meetings, and when required answered questions; and, further, that apparently they looked upon every problem from the point of view of their own department, and when asked questions usually contradicted each other flatly.

It has been said that the properties of the aggregate are determined by the properties of the units, and that when certain characteristics are present in the units the aggregate must disclose similar characteristics. It may be supposed, then, that the organization which was formerly adopted for the co-ordination of the defence of the British Empire as an aggregate, was evolved in accordance with the general characteristics of its components and of their political and geographical situation. Some development of this organization to meet existing requirements will, therefore, be most convenient, and in any case it is generally best to organize along lines of development, and not along those of radical alteration which always produces reaction. At first sight it would appear, therefore, as if some expansion of the Committee of Imperial Defence might meet requirements as regards the co-ordination of thought in the Imperial fighting services. On the other hand, it has been stated[1] definitely that, whatever may be the organization of the staff of these services, "the Committee of Imperial Defence, as a great instrument by which the Prime

[1] Debate in House of Commons, March 22nd, 1920.

Minister asserts his view and exercises his responsibility over the whole field of military policy, will certainly continue and endure." Some other line of development must consequently be adopted.

It appears that, at the present moment, the technical heads of the three fighting services in the United Kingdom do meet in conference and discuss the problems of defence, and that it is proposed to develop this arrangement. A weekly conference, however, in time of peace —and more frequent meetings are hardly possible for men with such extensive duties as those which devolve on the First Sea Lord, the Chief of the Imperial General Staff, and the Chief of the Air Staff— will not suffice for the comprehensive study of the problems of Imperial defence. And even if Indian opinion is to be represented by the addition of the Military Secretary of the India Office, provision for the effective statement of the point of view of the Overseas Dominions will apparently be lacking. In addition, it is far from probable that such conferences could be continued amidst the pressure of work that would inevitably follow on the declaration of a great war.

It would seem, therefore, that adequate consideration of, and consultation in regard to the problems involved in the military defence of the Empire can only be expected of men who are not encumbered with other duties. In other words, an Imperial Staff is required which should be separate from the Admiralty, the War Office and the Air Ministry; and should be composed of representatives, in proper proportion, of all the fighting services of the Empire, who should be appointed for a term of years only, and should then return to their service for a tour of duty. Since the Navy is still the essential fighting arm for the British Empire, a naval officer should be Chief of the Imperial Staff, a soldier and an airman being appointed as his deputies. It would be advantageous, but not essential, for a similar organization to be adopted in India and the Dominions, where branches of the Imperial Staff would work under the various Governments, and would deal mainly with local problems.

Burke once observed that " there is not, there never was, a principle of Government under heaven that does not in the very pursuit of the good it proposes, naturally and inevitably lead to some inconveniences . . . . ," and the formation of an Imperial Staff would not provide an exception to this rule. Great inconveniences would, undoubtedly, be experienced, for the fighting ministries would be deprived of the most important of their present duties, and the fighting services must overcome a good many of their prejudices; but these inconveniences would be of less consequence than the great advantages, as regards co-ordination of thought and effort, that would result from the formation of such a staff.

An Imperial Staff, clearly, must be an advisory organism only; for apart from the administrative difficulties which would follow on the creation of such an executive department even in the United Kingdom, its supremacy as regards the Empire would, as has been pointed out, involve the surrender by India and the Dominions of the great prerogative which distinguished a State from a Province, and would be foreign to the characteristics of the British comity of nations.

An Imperial Staff, therefore, might report in time of peace to the British Prime Minister through the Secretariat of the Committee of Imperial Defence, a meeting of the Committee being then called, if necessary. The reports of the Imperial Staff, with the opinions of the Committee, could subsequently be communicated to the Governments of India and the Dominions for their consideration. In war the reports of the Imperial Staff could be made directly to the War Cabinet, which, as was the case in the recent war, would in all probability have absorbed the Secretariat of the Committee of Imperial Defence.

An Imperial Staff, however, which was not concerned with executive functions, could not give advice unless its members were in the closest touch with the administrative situation of the fighting services; and that this is essential is proved conclusively by the fact that the British portion of the Inter-Allied Staff at Versailles, which was formed in 1918, rapidly became a War Office in miniature with a full Administrative, as well as a General, Staff. The Germans, whose General Staff was separate from the War Office, even found it desirable, owing to friction between the two departments, temporarily to unite the posts of Chief of the General Staff and War Minister in the person of General von Falkenhayn in November 1914. The posts were separated in January, 1915, but "co-operation was then so firmly established that it could hardly be endangered again."

It is necessary, then, if an Imperial Staff is to prove efficient, that co-operation with the executive departments must be so firmly established in time of peace that it will not be endangered during the far greater strain of war.

If an Imperial Staff must at all times keep its finger on the pulse of administrative problems when making its projects, it is quite evident that dependence on outside resources for military intelligence would be fatal to efficiency. Such a staff, therefore, should be composed of an amalgamation of the operations and intelligence branches of the fighting departments; and, as it is not improbable that at the present moment there is some overlapping in this work, such an amalgamation might lead to economy of personnel, and, therefore, of expenditure on this account. On the other hand, the fighting departments should retain supervision over training and the work of organization which now appertains to the General Staffs; but the Imperial Staff might, with advantage, undertake the duties of tactical inspection, which would also serve to keep its members in close touch with the personnel and material of the forces.

It is generally urged against plans for closer co-operation amongst the various States which compose the British Empire, that things must not be hurried, but must be allowed to develop spontaneously and organically; and there is much force in this contention, for an organization cannot be successfully applied until the political and social conditions are adapted for its use. On the other hand, it has been said that, "wherever the unhappy word organic finds its way into politics all thought disappears"; and if matters are left to spontaneous development only, the Empire may again find itself unprepared in the face of a crisis, and unable to take measures of security for fear of precipitating events.

It may, therefore, be wiser not to delay until unity of thought and outlook has been established among the officers of the Navy, Army, and Air Force, and until all have learnt to speak the same thing through the medium of the education afforded at a central school for the study of the art of war; but to remember that "men at some time are masters of their fates," and now to take some definite steps towards a more satisfactory organization than exists at present for the consideration of the intricate problems involved in Imperial defence.

FROM TSINGTAU TO THE FALKLAND ISLANDS.

By Hugo von Waldener-Haetz.

Chapters IX and X: translated by permission.
The Battle of Coronel.

CHAPTER IX.

To Grips with the Enemy!

ADMIRAL SPEE had ascertained from the reports submitted to him by the commanding officers of the "Dresden" and "Leipzig" that enemy fighting ships were on their tracks. The English were approaching from the south, the Japanese from the north. They were hoping thus to surround their proposed prey. But they were still far from accomplishing this! The strength of the German ships was as yet undiminished. . . .

At the war conference, which was held on board the flagship the day before the ships sailed from Easter Island, it was decided henceforth to seek out the enemy and force him to fight. His fighting forces were scattered. There was hope of meeting and vanquishing them one by one. The fundamental principle underlying all war wisdom is to attack at a given time and in the right place with superior strength.

Admiral Spee proceeded to act in accordance with this principle. On October 18th he left Easter Island with his combined battle forces. He had every reason to be satisfied with what had been accomplished hitherto. So far the enemy had been unable in any way to injure the squadron. On the contrary, the German ships had left behind them traces of their presence sufficient to cause anxiety to the enemy. What was of still greater importance, the foe had been unable to prevent the concentration of the ships composing the cruiser squadron.

Count v. Spee felt well satisfied as he inspected his squadron. It presented a stately picture. The five fighting ships, "Scharnhorst," "Gneisenau," "Leipzig," "Nürnberg," and "Dresden," were in line of battle, and astern of them followed the supply ships and transports under leadership of "Prinz Eitel Friedrich." They composed a formidable fleet of good, stout German ships manned by loyal German hearts. A thousand hearts and one mind!

"Victory will be ours," said the Admiral to himself with calm assurance. He knew that he could place implicit reliance on his ships and his men.

Their next halt was off the group of islands known as Juan Fernandez. These islands belong to Chili, and are situated at a

distance of over three hundred nautical miles from the mainland. In the sixteenth and seventeenth centuries they were much frequented by buccaneers. Alexander Selkirk lived here from 1704 to 1709, and his sojourn has been immortalized in the tale of "Robinson Crusoe." It is a lonely place to this day. The group consists of two islands, but only one is inhabited.

On October 26th Count v. Spee reached Juan Fernandez with his ships, but remained there for one day only. They coaled from the supply ships. The cruise was continued on a southerly course. Their vanguard was protected on its flank by the small cruisers. Any hour might bring forth an encounter with the enemy. In view of this, all mercantile ships they might meet were to be brought to a stand and questioned. "Leipzig" proceeded in advance. It was now the night preceding November 1st. Lieutenant Bornhuber, watch-keeping officer at the time, stepped on to the bridge. "Did you sight any lights?" he asked the officer whom he had superseded on watch duty. "Only in my imagination. In reality we sighted nothing at all during my watch. But there is something out on the horizon which may prove to be a light, but, on the contrary, may be only a falling star."

"We must ascertain what it is," said Bornhuber when the spot had been indicated to him. This time it was neither imagination nor a falling star, but undoubtedly a pale green light. Bornhuber reported to the C.O. and received orders to proceed towards it. "Leipzig" cut through the water at high speed.

They encountered a sailing vessel, a high seas fishing-boat, and kept alongside her at reduced speed. Bornhuber understood a little Spanish and was able to carry on some conversation with the master of the boat. By means of a few able questions he ascertained that an English cruiser had been sighted in the vicinity of Coronel. The fast "Leipzig" hastened back with this news to the main body. Wireless communication was not permitted. It was still of the utmost importance to surprise the enemy. Upon "Leipzig's" report the course to Coronel was interrupted in order to proceed against this isolated enemy vessel. Count Spee rallied his cruisers in the dim morning light, left the supply ships behind, and steamed south at a speed of fourteen knots. He was about twenty nautical miles from the Chilean coast. The signal "Lessen smoke!" was given, but the order was not necessary; every man on board knew how critical a time it was, and every man was at his post, determined to do his utmost. A joyful feeling reigned among them. At length the day had arrived on which they could measure themselves against the English, for no one doubted but that an encounter would take place that day. The crew were so eager to remain at their battle stations that they even grudged the time spent over their meals. They seized every opportunity of gazing through the slits and apertures, for each one was anxious to be the first to sight the enemy.

The chief gunner's mate, Hoffmann, said: "It will be a proper fight if, when we encounter the Englishmen, which we are dead sure to do to-day, they are in equal strength to us, for there's no doubt they are clever seamen and good gunners. No one can deny that."

Jantzen, the leading seaman, who was lying on the ground among his shells, joined in the conversation and said: "That's quite true, but we've got more courage than they have, and then, just think of our ammunition and our shooting! We shall jolly well thrash them, once we begin!"

"That we shall, that we shall," his superior said, busying himself with his telescopic sights for the hundredth time. "That's exactly what I think about it. But the English are formidable enemies, and they'll fight like lions."

The captain of the turret was of the same opinion: "There's no doubt they'll fight bravely if only for the sake of their reputation. England doesn't possess a Nelson for nothing."

But however they might respect the foe, they did not doubt their own victory. In time of peace, service had not always been easy, nay, sometimes it was very hard. But now everyone realized that the hard school they had been through had been necessary. Men had been turned out who were now able to face the enemy calmly. . . .

It was now four o'clock in the afternoon. A stiff breeze had been blowing since noon. It came from the south with a force of six. As the cruiser squadron was proceeding on a southerly course, wind and sea came from starboard. The big ships began to roll, and the small cruisers shipped water.

It was a beautiful day; the sea was of a dark green colour; the crests of the waves were tipped with white foam, which glistened in the sunlight. In a cloudless sky the sun was slowly sinking to rest.

The small cruisers were sent time after time to act as scouts. So far, there was nothing to be seen of the enemy. Shortly after four o'clock "Nürnberg" had vanished from sight in a north-easterly direction. At that time "Dresden" was over twelve nautical miles astern of the squadron. "Nürnberg" was in pursuit of a steamer. "Dresden" was after a sailing vessel. The two armoured cruisers and "Liepzig" were forty nautical miles north of the Bay of Arauco. They steamed on at a moderate speed.

Lieutenant v. Wensien was clinging to "Gneisenau's" foremast to the amusement of his comrades, who teased him when he began to clamber up. "What! a tall chap like you in the foretop!" they said. "Surely, with your height, you could see enough on deck!" But Wensien persisted in joining the look-out in the foretop. Before five minutes had elapsed, he met with his reward.

At precisely 4.17 p.m. Wensien laid aside his binoculars and shouted through the speaking tube to the bridge: "Two steamers in sight to the S.W., they appear to be men of war proceeding on a southerly course!"

The report was forwarded by means of signals to the flagship. They had not finished signalling when Wensien's voice was again heard: "A third ship in sight in the same direction, proceeding on the same course!"

Now hundreds of sharp eyes searched the horizon, and a few seconds later the news ran through the various ships. "We see them! The enemy is there!"

"Scharnhorst" hoisted a flag signal: "Pursue the enemy! Full speed ahead!"

As the flags were lowered, the leading ship turned to starboard towards the enemy. The water broke foaming over their bows as the vessels turned and raced on over the sea. Now there was a head sea, and under the impetus of their wild course it surged right over their forecastles. The German ships shuddered under the heavy thudding of the engines. This was no time to economize coal; they must overtake the enemy at all costs. The smoke poured out of the funnels in thick heavy swathes and streamed behind the squadron.

The distance from the enemy ships was still great, though they could now plainly be discerned. The armoured cruiser, "Monmouth," and the small cruiser, "Glasgow," led; the auxiliary cruiser "Otranto," followed.

Shortly after 4.30 it was seen that the English ships were steaming in a westerly direction. "Greatest possible speed!" ran the order given to the engines, and they surpassed themselves. Right on to the bridge the power at work inside the ship was felt.

The Admiral, and with him "all hands," dreaded the night which would provide cover to the enemy. It was terrible to think that he might escape. Every sailor who caught sight of a stoker cried to him: "Feed the engines!" and the stokers laughed and answered: "No fear! we'll do our share all right! Just you see that you shoot straight!" shaking hands on the bargain.

It was a breathless race. "Scharnhorst" stormed on ahead, covered with white foam. "Gneisenau," and even the fast "Leipzig," could scarcely keep pace with her.

Now the German aerials began to hum. "Nürnberg" and "Dresden" were called up, and as soon as the enemy began to use his wireless, everything possible was done to jam his signals. Before the guns began to speak the wireless battle raged.

The minutes flew by one after another. They were but slowly gaining on the enemy. The wild chase had already lasted over an hour.

At 5.20, a fresh vessel was sighted. Hurrah! another enemy! She proved to be the "Good Hope," the flagship of Vice-Admiral Cradock. The ship placed herself at the head of the English line, which was now in order of battle. The two squadrons were now approaching each other on a southerly parallel course, and their battle pennants were solemnly hoisted on their masts.

Just as the sun was sinking in a blood red flame of fire, the battle began.

CHAPTER X.

The Battle of Coronel.

"What is the range?" inquired the Chief of the Staff. The First Gunnery Officer read the range as given by the rangefinder and reported: "13,500 m. from 'Good Hope'!"

"Is the range lessening?"

"Slowly."

The Chief of the Staff looked at the sun to see how high it still was above the horizon, and then stepped up to the Admiral: "Perhaps, Count, it would be as well to try and approach more quickly?"

Count v. Spee nodded and gave the order: "Turn one point to starboard."

For a few seconds the signal flags waved from the mast in the strong breeze, then the order was understood. "Scharnhorst," "Gneisenau," and "Leipzig" turned one point towards the enemy. The ships were consequently formed on a line of bearing. All broadside guns remained bearing.

"Open fire at 10,500 m.," ordered the Admiral.

The battery telegraphs in "Scharnhorst's" armoured conning tower set to work. Electric bells were rung, and in a low but clear voice the gunnery officer gave his orders:

"Direction 17°—on the enemy's leading ship—10,500—deflection left—shells—heavy guns fire!"

The forward turret swung in the direction of the foe, and the long muzzles of the guns rose slowly. The guns on the starboard side made the same movement. "Scharnhorst" stared out threateningly towards the long sought enemy. Count Spee turned to the Chief of the Staff, a light shining in his usually serious eyes. "No escape for them now!" said he in the sure hope of victory.

"The range is diminishing more rapidly!" reported the gunnery officer through the narrow aperture of the conning tower. Shortly afterwards he cried: "The range is 10,600!"

Count Spee made a slight sign and his flag lieutenant cried: "Hoist the signal 'Open Fire'!" and as calmly as if he were at a shooting practice the gunnery officer gave the order "Fire!"

And with that one word disaster broke over Admiral Cradock's squadron. Barely three seconds afterwards the very air quivered under the thunderous crash of a falling salvo. A light brown powder smoke blew past the ship carried rapidly away by the strong breeze. The fire zone was clear. The ships of the enemy's line lay like so many dark shadows sharply silhouetted against the red gold evening sky.

Immediately after, "Scharnhorst," "Gneisenau," and "Leipzig" opened fire. "Gneisenau" engaged "Glasgow," and "Dresden," who had come up in the meantime, opened fire upon "Otranto."

"Dresden's" first salvoes were successful. The English auxiliary cruiser did not like the taste she got of them. She turned off and made for the open sea.

At 6.34 p.m., the German line had opened fire. Five minutes later "Good Hope" received the first hit. The gunnery officer in "Scharnhorst," with his binoculars at his eyes, was awaiting the moment at which the shells would burst. They had a long way to travel. They required over 30 seconds for the journey. A spotter recorded the time.

"Scharnhorst's" first salvoes had fallen wide. The gunnery officer changed the range to ten thousand. His tone of voice was so measured, one might almost say so indifferent, as he gave the

order, it might have been thought that time was of no importance, but, on the contrary, every second was valuable. Orders were transmitted to the guns by telegraph and telephone, received and followed. The guns were constantly reloaded, traversed, and elevated, and over again they filled the air with the crash of thunder.

Firing was difficult. The crests of the waves rose high in the strong wind. The ships tossed hither and thither unceasingly. Water foamed up over the small cruisers' forecastles, and then flowed streaming over the upper decks. The gun crews and ammunition carriers found it difficult to keep their feet.

Admiral Cradock did not open fire until after the light caused by the bursting of the German shells had been seen, and thick brown clouds of smoke betrayed the fact that the "Good Hope" had been hit. We do not know why he hesitated so long, but by doing so he wasted his best trump!

"Scharnhorst" and "Gneisenau" had now got their range, and from now on they kept it. Regularly, as if driven by clockwork, the fury of their shots broke upon the enemy.

"Form line ahead," ordered Count Spee. "By doing so it will be easier going in this rough sea."

"Signal: Alter course one point to port!" cried the flag lieutenant in obedience to this order. As soon as the signal had been taken in the ships returned to line of battle. The English shells were by this time raining down upon them, but the enemy's fire remained uncertain, although the range was now sensibly diminished.

"The first quarter of a hundred!" cried "Scharnhorst's" gunnery officer suddenly. The members of the squadron staff and the C.O. looked at him in astonishment. What could he mean by this? Such a remark had nothing to do with gunnery. But in the meantime the gunnery officer continued his orders: "6,400—Fire!"

When the salvo had fallen the C.O. asked him hastily: "What did you mean just now?"

"The first quarter of a hundred? 'Good Hope' has received twenty-five hits!" and he continued quietly: "6,200—Fire!"

"'Monmouth' has received a heavy hit," called out the flag lieutenant now.

A well-aimed shot from "Gneisenau" had blown up the armoured roof of the English ship's forward turret, and a thick column of flame burst out from within the turret. Their ready-use ammunition had caused the fire.

"Turn away one point to port," ordered Count v. Spee, "we are making it too easy for the enemy."

"Scharnhorst" had already received two hammering blows on her sides, and a 15 cm. casemate gun reported: "A piece of shell has stuck in the port-hole."

Bursting shell had also been flying around "Gneisenau"; she must have received a hit.

The English ships pressed on when the German ships turned. Their gunfire gradually grew weaker. It was clear that Admiral Cradock was endeavouring to bring torpedoes into action, finding

that his artillery was inferior to the German. Count Spee, however, prevented this. His fighting force was still intact, and he was so situated as to be able to defeat the enemy with his artillery alone.

When "Scharnhorst" turned so abruptly to port, the forward 21 cm. turret temporarily ceased to bear, and Lieutenant Berg gave the order: "Cease fire, battery, cease fire!" Both guns were carefully loaded and then put to safety, and the turret swung into place ready for action. Absolute stillness followed. The crash of those guns which were still in action was plainly to be heard, but inside the forward turret all noise suddenly ceased, with the exception of orders from the gunnery officers. Telegraph and telephone were still at work.

Sweat poured off the men. The battle had lasted for over an hour. The heavy guns had been loaded, traversed, and directed on the enemy over sixty times. Ears had been deafened by their dull thuds, and eyes had smarted from the smoke from the powder. Their breath came in great gasps, and their limbs trembled from the force of their exertions. But, in spite of all this, they looked at one another well-pleased. Their hearts beat high with a feeling of work rewarded and with the hope of victory.

Lieutenant Berg glanced rapidly over his brave crew. He would have liked to be able to shake hands with them all. But the aperture in the turret again attracted his eye. He must follow the course of the battle in order to take part in it at the very moment when the enemy should come within the range of his guns. First-mate Hoffmann was also indefatigable. He personally examined every part of his gun, and insisted on his men doing so too. "Now begins the last act," he said. "The dance is just about to start." Threateningly, he shook his fist in the direction in which he supposed the enemy to be.

"Well, sir, everything went first-rate, did it not?" Jantzen said coming up to him. The officer put his heavy hand on the man's shoulder. "I'm quite satisfied my man, you all did your duty right well. You see how useful manœuvres were."

Jantzen grinned: "Yes indeed, sir, we do, and we've quite forgotten all the 'sheep's heads' and 'silly asses!' that seemed to be necessary then. . . . ."

The petty officer felt the gun with his hand, and said: "It's warm still, but it shot well. We can account for five hits at least."

Jantzen returned to his heavy shells. They came up in the lift which was loaded in the magazine. The ready-use ammunition had been prepared with great care.

"The ship is turning to starboard!" was telephoned down from the bridge.

"Action!" ordered Lieutenant Berg. The captain of the turret opened the starboard lever of the hydraulic training gear. The turret turned slowly to the right with a grating noise. "5,400" rang through the telephone. "Aim on 'Good Hope'!"

And shot after shot was fired from the forward 21 cm. turret.

In the meantime it had grown dark. The electric light had been turned on in order that the men could see to carry on their ceaseless

work. Even by its bright light no slacker could be discovered. The ship's crew and the gun crews worked as well and as steadily as if at daily practice. The full moon shone high in the heavens, but the wind threatened storm, and out of the shadows of the night the British ships shone like so many lanterns.

Soon after darkness fell a column of fire rose high between the funnels of "Good Hope." "Monmouth," too, was burning. Both ships ceased firing towards half-past seven. Their vitality had been utterly destroyed. "Glasgow" sought the open sea at nightfall. She escaped her pursuers under cover of the blinding light which came from the fires on the other ships. She turned south to seek the English battleship "Canopus," which had been intended to strengthen Admiral Cradock's squadron.

The union with "Canopus" had been planned for the following day. We must assume that the English cruisers which had taken part in the battle had been on outpost duty awaiting the German squadron. It had not been intended that they should fight. Rather had they been commissioned to search out and hold the enemy so that he might later be overwhelmed and destroyed by the preponderating strength of the Japanese ships coming from the north and acting in union with the entire English force. This plan was brought to nought!

In spite of the rough sea, which was unfavourable to an artillery battle, and which necessitated larger space for a decisive action than would have been afforded by a quiet sea, Count Spee forced the issue. The lateness of the hour proved no deterrent to him. He saw the enemy and attacked him with measured wisdom and skilful use of the force at his disposal.

Everything points to the fact that the British Admiral was very unwilling to fight. He was compelled to do so; it was rendered impossible for him to avoid the enemy.

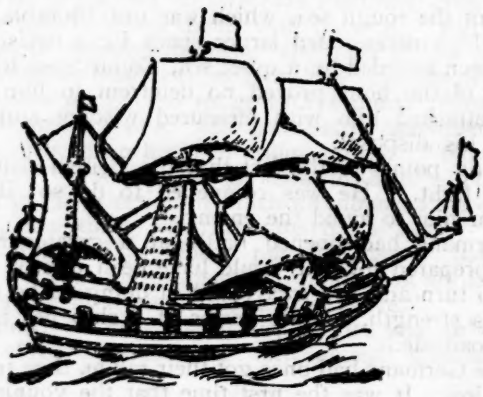
The Germans had opened battle at a greater range than the enemy was prepared for. It would have been utterly useless for him to attempt to turn and run away, and in doing so he would but have weakened his strength, for the power of a ship lies not in her stern but in her broadside.

After the Germans had once got their range, they remained masters of the situation. It was the first time that the young German Navy had measured arms in open battle with the British Navy, whose history—one must acknowledge—formed a long chain of glorious deeds.

The respective strength of the four armoured cruisers, with which the decision lay, was by no means such as to guarantee the victory to us. An analysis of the strength of the four large ships shows that the tonnage on the German side amounted to 23,200 tons, and on the English side to 24,250 tons. The German crews numbered 1,528 against 1,440 British. "Scharnhorst" and "Gneisenau" carried twelve 21 cm. and six 15 cm. broadside guns against two 234 cm. and fifteen 15 cm. guns on the British side.

"Good Hope" and "Monmouth" went down with their entire crews. It was impossible to make any attempt at saving the men's lives. The rough sea effectually hindered this. "Scharnhorst"

received two hits, "Gneisenau" four. "Gneisenau" had two men slightly wounded. This is a complete list of the casualties sustained by us in the Battle of Coronel, in which German strength and skill gained an undying victory, and one which materially dimmed the glory of England's mastery of the sea. For it was not so much our preponderance in ships and armaments that gained us the victory, but rather the better quality of our guns, our superior shooting, and skilful leadership. The Battle of Coronel will ever be memorable in the annals of the German Navy. On that day Count Spee's name was enrolled in the list of German heroes.



A GERMAN ACCOUNT OF THE GERMAN-TURKISH EXPEDITION AGAINST THE SUEZ CANAL IN 1916.

AN interesting article under the above heading, written by Hauptmann von Heemskerck, appeared in the *Militär-Wochenblatt*, of December 9th, 1919 (No. 69). The completeness of the failure, if not disaster, of the German-Turkish attack is carefully minimised, and the reader will be much amused if he was in Egypt, or will turn to Lieut.-General Sir John Maxwell's despatches on the period. Some of the more important discrepancies will be pointed out in footnotes.

The author remarks that the idea of strangling the British Empire by seizing the Suez Canal was conceived soon after the entry of Turkey into the world conflict, and that Turkish headquarters, who had been promised the support of the German Supreme Command in this undertaking, made the necessary preparations for it as early as November, 1914.

The theatre of operations, the Sinai Desert, was, he says, unsurveyed territory, and its tropical heat and lack of water, combined with the few and indifferent roads and means of communication, offered great difficulties for carrying out military operations. He adds that these difficulties were not sufficiently appreciated by either the Turkish or the German General Staffs.

In February, 1915, an advance was begun against the Canal by an Expeditionary Corps,[1] with inadequate material and resources, led by Djemel Pasha, the commander of the Turkish Fourth Army. After a march of 90 miles, through the desert, it succeeded in reaching the Canal, south of Ismailia, on the afternoon of February 5th. Two Turkish companies were put across the Canal in pontoons and drove back the weak British post.[2] A pontoon bridge was then successfully constructed and five battalions were able to reach the western bank.[3] The heavy batteries, commanded by German officers, which had been brought with the column, succeeded in sinking some vessels south of the bridge.

The author describes the fate of this first expedition in a few lines: "The northern Turkish column, advancing to attack Ismailia, got into a sandstorm and lost its way. The bridge was thus left without any

[1] The enemy engaged at different points along the Canal appeared to number 12,000 to 15,000 men and six batteries, with at least one 6-inch gun.

[2] This must refer to the fight at Toussoum on February 3rd; on the 5th the German-Turkish forces were retreating. Three pontoon loads got across the Canal and were completely accounted for, 20 prisoners being taken.

[3] Nothing of the kind occurred. Attempts were made to construct a bridge, but the pontoons never left the east bank.

flank protection to the north. On the morning of the 5th (sic) February, a British cruiser, coming from the north, fired on the pontoon bridge and destroyed it.[1] Of the troops that had crossed the Canal one battalion remained in the hands of the enemy. The total losses of the Turks were about 1,000 men."

The expedition had been given only a fourteen days' supply of provisions and ammunition, and so it only needed slight pressure on the part of the British to force the Turkish Corps to retire on Jerusalem.

The undertaking was thus a failure, but it had showed that quite other preparations, more carefully worked out, were needed to block the Canal for traffic even for a short period. It had also proved that the ambitious plans for the conquest of Egypt and for threatening British dominion in Central Africa were completely Utopian. Quite apart from the difficulties of desert warfare already mentioned, the author considers that a glance at a map, showing the lines of communication, should suffice to demonstrate the impossibility of feeding a strong force on the Canal front and keeping it supplied with the necessary material. Further, it was realised that if another expedition was to have any prospects of success, the presence of German units, especially flying sections and units for intelligence and motor transport work, was absolutely essential.

The economic and technical foundation for a Canal Expedition would therefore have to come from Germany, and owing to the British mastery of the Mediterranean, the various units and material would have to be brought by the Bagdad Railway, with its single track and small carrying capacity, and thence by the narrow-gauge extension lines through Syria and Palestine. Even this indifferent means of communication was further interrupted by the Taurus and the Amanus mountain ranges.

To emphasise the difficulties of this journey the writer sets out in detail the route taken by No. 300 Section of the German Flying Corps and its appurtenances, which was detailed for the second expedition in 1916. It went by Berlin—Budapest—Belgrade—Nish—Constantinople on the Orient Railway, which had only a single track in places. The material was then transported across the Bosphorus to Haidar Pasha in small wooden barges, and thence by the Bagdad Railway by Konia to Bozanti in the Taurus. Here it had to be loaded on to pack animals, the aeroplanes themselves being put on to motor lorries, and carried 44 miles through the mountain pass. After a short journey by rail this process had to be repeated across the Amanus mountains. Engines stoked with wood then took it by Aleppo and Homs to Rajak, and here it had to be transferred to the narrow-gauge line that runs by Damascus and Jerusalem to Birseba, the rail-head. This place is 90 miles east of the Suez Canal, and the last stretch had to be accomplished by means of camels and donkeys, whose capacity was considerably limited by the constant shortage of fodder.

[1] The British cruiser was T.B. No. 043, which destroyed not the bridge, which did not exist, but the pontoons lying on the east bank.

The writer then compares this situation with the conditions that obtained with the enemy, explaining that the Suez Canal is connected with the hinterland by a complete network of railways, and that in spite of the submarine war, troops and material could be transported in nine to eleven days from the Mother Country to Port Said.

In spite of all the difficulties involved, a second attempt to block the Canal was nevertheless decided upon in view of the great effect it was sure to have on the whole military situation and of the special effect it would make on the Mohammedan population. The whole of 1915 was therefore spent in preparations. Colonel von Kress, who had acted as Chief of the Staff of the VIIIth Corps in the first expedition, supervised the construction of wells and roads in the actual zone of operations in the Sinai Desert. Food supplies and means of transport were requisitioned locally and concentrated in readiness.

The German Supreme Command decided to send an expeditionary corps, including a flying section, motor transport and intelligence detachments and a number of machine gun units, as well as four heavy batteries. Austria also helped by sending a mountain howitzer division of two batteries. Special trouble was taken with the flying section, for which exceptionally experienced men, with their machines, were sent from the Western Front. The advance party of the flying section started on its journey to the Sinai peninsula on February 25th, and it was only accomplished with the utmost difficulty. On March 31st this first detachment arrived at Birseba, the headquarters of the expedition. The remainder of the flying section followed in the second half of April.

The preparations for the expedition covered a long period, and Colonel von Kress, who was appointed to command it, had to contend with difficulties which only one who understands the complicated military and political conditions of the country can fully realize. The transport of all the material and personnel from Germany was also considerably delayed.

The Turkish General Staff thought it desirable to impress on the British Government the danger threatening the Canal, and therefore ordered a flying column under Colonel von Kress to make a preliminary expedition in April, 1916. The reconnaissance work through the Sinai Desert up to the Canal was successfully performed, with the help of the first detachment of two aeroplanes which had arrived. The objective, the oasis at El Katja, twenty-five miles east of the canal, was photographed from the air and the presence of about a battalion of British troops was fully confirmed. When the advance from Birseba began the aerodrome was transferred to El Arish, a police station on the Egyptian frontier.

The advance was made unnoticed by the enemy's aeroplanes, and on Easter Sunday, 1916, the two British outpost squadrons were captured after a short skirmish. At 10 a.m. the attack on the entrenched camp at El Katja began and it hoisted the white flag at 2 p.m. On the same evening the retreat was begun, unmolested by the enemy. A complete

regiment of Yeomanry with all its supplies and the column of transport animals belonging to the camp had fallen into Turkish hands.[1]

This undoubted military success was due to the excellent preparations made and the exemplary manner in which the operation was conducted. The marching powers of the Turkish Infantry, which had covered seventy-five miles across deep desert sand in three night marches, thus enabling the surprise attack to take place, were beyond all praise.

In spite of this, however, the writer confesses, the whole scheme was a failure in so far as it concerned the main expedition which was to be made later on. The reverse which the British had suffered east of the Canal excited considerable comment in the British Parliament and accusations of slackness were made in regard to the defence of Egypt. The result was the recall of the Governor[2] and stronger measures being taken for the defence of the Canal front.

The hot summer months that followed were spent by the flying section in preparation for the attack on the Canal which it was intended to make in the late summer, and the whole zone of the future operations east of the Canal was photographed from the air, enabling the roads and tracks to be shown on the maps. A clear idea was also gained of the feverish activity of the British troops after their Easter surprise. They had formed the girdle of oases east of the Canal into a continuous line of forts. From Kantara a light railway had been constructed eastwards through the desert in order to enable a strong force of troops to be employed east of the Canal, and the constant ship traffic showed that they were making all technical preparations "with their usual thoroughness" to go from the defensive to the offensive if necessary. Our aeroplanes interfered with these preparations considerably by frequent bombing raids, but their real objective, to stop the traffic through the Canal by bombing Port Said, Suez and the main sluice-gates, was not accomplished.

The main expedition itself was also doomed to ill-success. The air reconnaissances had gained complete knowledge of the enemy's forces. His strength could be estimated by the tent-camps in the photographs, and the nature and position of his entrenchments and wire entanglements, as well as the gun emplacements, were all as far as possible traced out on the very incomplete maps at the disposal of the expedition. Much anxiety was, however, caused by the state of the supply requirements, as the promises made by the Turkish Fourth Army had only been partially fulfilled. The heavy batteries, too, from Germany had not arrived. These had been sent off as soon as possible, but owing to the poor

[1] The R.F.C. reported the column on the 22nd, it was about 2,500 men strong. It attacked the Ogh Ratina and Qatia posts at 5.30 in the morning of the 23rd. The garrison, two squadrons, surrendered at 2 p.m. A third squadron operating outside Qatia, except 1 officer and 60 men, fell into the hands of the enemy. The German writer says nothing of the successful resistance of two determined attacks on the Dueidar post, held by a hundred men of the 5th Royal Scots.

[2] The Supercession of Major-General Sir John Maxwell, by Lieut.-General Sir Archibald Murray, on March 11th, 1916, must be alluded to, which merely ended the dual control in Egypt and had nothing to do with any supposed German success.

condition of the pack-animals the transport of the guns over the Taurus and Amanus mountain ranges had given great trouble.

In spite of the disadvantageous conditions, the commander of the expedition decided to keep to the date originally planned for the advance to begin against the Canal, and on July 15th the leading troops of the advanced guard marched out of El Arish towards the Canal, followed by the remainder of the expeditionary force.

The concentration, which had had to be completed in the desert without the slightest means of concealment, and even the advance, although made only by night, could not be kept hidden from the enemy's aeroplanes. When the advanced guard arrived within twenty-five miles of the Canal it therefore came up against an enemy already in position in superior numbers and waiting for the attack. The outpost troops were driven back, but the leader of the column decided to delay the main attack until the German batteries, which had at last arrived, were in position. Whether this decision was wise is uncertain, but it gave the enemy time to complete his defensive measures in every particular. In the end, moreover, only two of the batteries were able to get into position, as the mortars could not be brought through the deep sand. The flying section sent two aeroplanes to remain abreast of the main body of the column at Bir-el-Abd for reconnaissance work at close quarters.

The attack against the British positions was arranged for August 4th, to be made by four assaulting groups. At dawn all available aeroplanes bombed the enemy's camps and kept the fire of the German and Austrian batteries under observation. The attack of the Turkish Infantry that followed was, however, repulsed and the British counter-attacked in places, so much so that the expeditionary corps had to abandon the positions it had occupied. The flying section did its utmost to harass the enemy by bombs and machine gun fire, but the further plans of the commander of the expedition were dominated by the question of supplies, and Colonel von Kress decided to begin a short withdrawal so as to be nearer El Arish, the supply depot, still keeping touch, however, with the British positions.[1]

During the next few weeks the enemy further strengthened his defence works, and the light railway already referred to was rapidly extended. As a result of this, not even small Turkish detachments were able to reach the Canal during the remainder of the war. It was not till eighteen months later that German engineers succeeded in completing another section of the Bagdad railway by finishing the Amanus tunnel. A light field railway was constructed over the Taurus, the daily carrying capacity of which was considerably more than that of the normal track of the Bagdad railway itself. But by that time the British were able to go away on leave in through-trains with sleeping and dining cars from Jerusalem to Cairo, in thirty-six hours, straight across the Sinai Desert.

[1] This refers to the German attack on the Romani-Mehemdia position; perhaps its vigorous repulse and the loss of 2,500 prisoners, besides heavy casualties and a cavalry pursuit, had something to do with the "short withdrawal."

GENERAL SIR E. ALLENBY'S FINAL DESPATCH.

Criticism by General of Cavalry Liman von Sanders.

THE *Militär-Wochenblatt* of October 21st, 1919, contains an article entitled "Syria and Palestine," by General Liman von Sanders, formerly the German commander of the Turkish fronts. In it, he criticizes extracts from Field-Marshal Allenby's report translated in the *Militär-Wochenblatt* of the 9th and 11th October, and taken from the English version published in the *Morning Post* of August, 1919.

He refers particularly to the last paragraph of the report, in which he says the estimates given of the Turkish losses in Palestine might easily lead to misunderstanding. He therefore makes the following statements to bring out the actual facts of the case.

He gives the total number of combatant Turkish troops on the front of Army Front F., including the personnel of the baggage columns, on September 19th, the day of the great decisive attack in Palestine, as not quite 30,000 men.

Of the Turkish troops who took part in the retreat to Aleppo and carried on to the end, four divisions, he says, with a total strength of 10,000 men, were re-formed at that place, to which were added 2,000 fresh troops. These divisions, under the command of Mustapha Kemal, were able to repulse various attacks by the British and Arabian forces on the heights about Aleppo on October 25th and 26th. The number of prisoners made on the front of the Army Group cannot, therefore, have amounted to more than 20,000 at the most.

General von Sanders agrees that this figure is a lamentably big one, but it should be remembered, he says, that during the march through Damascus alone about 7,000 Turks disappeared. If Field-Marshal Allenby, he says, actually assesses the number of prisoners made as 100,000, he must be including about 80,000 who were never at the front, such as the transport column, ammunition troops, labour formations, and the patients of the numerous hospitals and sanatoria; also the Arabian battalions from the desert, who went over to the enemy without firing a shot, and the Arabian battalions of the Second Army, which only came under the control of the Army Group during the retreat; further, he must be including the troops from Maan and other stations on the Hedjaz railway whose line of retreat was cut off by the 20,000 Arabs operating in the country east of the Jordan under Sherif Faisal.

He mentions the German fighting units on the Palestine front on September 19th as being the Asiatic Corps, of about 1,200 men, and the German 146th Infantry Regiment, about 1,600 strong, in addition to a few German and Austrian batteries. These troops, he

says, fought with the utmost gallantry during the retreat, and had only very few, mostly wounded, men taken prisoners. The German prisoners that were made were, he adds, almost entirely from isolated German formations distributed among the Turks, such as intelligence services, motor columns, hospitals, and the like, which, for the most part, were unable to get back to their German units.

Regarding Field-Marshal Allenby's statement that about five hundred guns were captured, General von Sanders states that this cannot have applied to those on the front of the Army Group of September 19th, since the Seventh, Eighth, and Fourth Armies had in all nothing approaching that number. He imagines that the obsolete guns on the coast defences and the large number of unserviceable guns withdrawn previously from the front, which might have been found in the repair shops, etc., have been included in the figure given. Almost all the guns at the front which were lost were, he says, not captured by the enemy, but had to be left standing where they were on the first two days of the retreat, because the teams, which were quite exhausted, were unable to get them away. These animals, during the whole summer, had only been given a daily ration of two pounds of oats in addition to the dried-up grass in the neighbourhood. The majority of the guns left behind were first of all rendered unserviceable.

In excuse of his defeat, General von Sanders remarks that the British numerical superiority on the desert front, which was not broken through till September 19th, was approximately tenfold, and that there were about 14,000 British cavalry available for the pursuit, as opposed to 1,200 Turkish cavalry.

The British superiority in aeroplanes was, he adds, far greater still in proportion than that of the cavalry, since on the day of the attack, the commander of the flying section of the Army Group reported that he had only five aeroplanes available which could be employed against the enemy. In conclusion, General von Sanders records that during the spring and summer the splendid German flying section had lost fifty-nine pilots and observers, owing to their machines being inferior to the quite modern type used by the British. British officers have given the number of aeroplanes contained in these many squadrons used in those days on the Palestine front as 180. Even now, General von Sanders cannot or will not see that he was out-manœuvred and out-fought quite as much as the French were in 1870-1, and, by German precedent, defeated.

THE SUBMARINE AND FUTURE NAVAL WARFARE.

By Lieut. W. S. King-Hall, R.N.

On Wednesday, April 7th, 1920, at 3 p.m.

Admiral Sir F. C. D. Sturdee, Bt., K.C.B., K.C.M.G., C.V.O., in the Chair.

The Chairman: I have much pleasure in introducing Lieutenant King-Hall, who has kindly come here to give us his views on the submarine and future naval warfare. He hardly requires an introduction. During the war, between the times of fighting the enemy, he considered the problems of naval warfare and competed in the Gold Medal Essay competition and obtained the Gold Medal of this year. I ask him, as a Gold Medallist of the Institution, to read his paper.

LECTURE.

WHEN the Council of this Institution honoured me with an invitation to deliver a lecture, I submitted a draft of what I proposed saying to the necessary authorities at the Admiralty. I was given permission to lecture on the understanding that I made it clear that the views I expressed were entirely my own and were in no way official.

In dealing with futurities it is necessary to be on guard against making extravagant prophecies of a more or less imaginative nature. Prophecies such as: "The day will come when we shall be crossing the Atlantic in aerial liners," are of no assistance either to intending transatlantic passengers, or to the directors of transport companies.

What prophets ought to do is to stick to practical facts, name the day, explain how results are to be achieved and on what lines developments should proceed.

Consequently I wish to emphasize at the outset that I have endeavoured to examine the subject matter of this lecture from a strictly practical and definite point of view—which is as follows: The subject has been treated from the point of view of the British Empire, and my ideas are those on the effect which submarine ships will have on our methods of conducting naval war within a period limited by the date 1930.

In all forms of warfare there are certain simple truths which have been known from the earliest times. One of these is that an advantage may be gained by surprising the enemy, both tactically, and

strategically. An obvious method of obtaining surprise is to approach the enemy without his being aware of your movements. There are of course other methods such as approaching him openly but concealing your hostile intentions from him, but the first method of surprise is the one that concerns us to-day.

It must have been realized thousands of years ago in land warfare, that use could be made of rocks and trees for the purpose of surprise, but for centuries the flatness of the oceans entirely prevented tactical surprise in sea warfare. The only way in sea-fighting of approaching the enemy in an unobserved manner during the daylight hours is to get under water, since this manœuvre gives concealment from one of the enemy's defensive weapons—his eyes, though he may yet detect you by using his ears.

About 300 years ago the first attempt was made to navigate under water in a ship, but progress in submerged craft was slow up to the end of the first decade of the XXth Century. I do not propose to say any more as to the early development of submerged craft as this subject is usually dealt with at length in the opening chapters of books on submarines.

Bearing in mind that the root idea of making a warship move under water is to obtain surprise, I propose to devote five minutes to classification of the different types of warships in use to-day; this accomplished, the way will be clear for a discussion as to the effect of submersion upon the powers of different classes of ships.

Experience has shown that certain operations have to be carried out in naval war, but since it is impossible to build sufficient suitable ships for every imaginable duty, certain *types* of craft have been evolved, each being specially suited for some of the most important operations which are likely to arise.

These types are: The battleship type, the cruiser type, and the auxiliary type.

First, as regards the battleship type, so often condemned as obsolete on paper, invariably triumphant in practice up to the present moment.

I suggest that much of this apparent inconsistency between theory and practice is due to the use of terms which have not been clearly defined.

The "battleship" should be defined somewhat in this manner:

"She is that craft, aerial, surface or submerged, which combines in one unit the best tactical powers for battle purposes."

From this definition, it seems to me that the battleship can never "die" as long as naval war "lives."

The matter open to argument narrows down to the question as to what is the best combination of tactical powers to put into the battleship to enable her to carry out her duty of destroying enemy battlecraft.

In addition to the ship for battle purposes, experience has shown that it is necessary to have other ships in the Navy. This need is partly due to the size and cost of battleships, and partly owing to the fact that, as a battleship is designed in the first instance for battle duty,

she is not entirely suited for other naval operations, such as inshore work, reconnaissance, etc.

An important type of warship additional to the battleship is the cruiser class.

Any craft may have to do "cruiser duties," if the craft built specially for the purpose are not sufficiently numerous.

Finally, I consider that all other kinds of ships except submarines, can be conveniently classed as auxiliaries. In this class, I group "Specialist" ships whose design is primarily connected with a special object, as for example—minelayers, C.M.B.'s (which were originally only intended to be very rapid torpedo carriers), bombarding ships, aircraft carriers, etc.

I exclude submarines from belonging to any particular group of naval instruments because such inclusion is, to my mind, entirely wrong.

It was once correct to speak of "submarines" as being an individual class of ship; in 1908 it was correct so to do because at about that time the submarine *was* a very special limited kind of craft not far removed from a slow moving mine. Probably when the Navy was changing from sail to steam one might, with some reason, have classed ships as battleships, cruisers and steamships.[1] At the present day, and especially in the future, to describe a craft as a submarine tells one nothing more than that she can go under water, she may be a minelayer, a torpedo carrier, or even a survey ship, of which class I believe there is at present one example in commission.

I might as well attempt to describe the "Queen Elizabeth" by saying that she is a steamship. Submersion must be considered as part of a ship's fighting powers, like speed, armour, or armament. The ground has now been cleared and the main problem stands clear from the undergrowth. Three groups of ships are needed for the various operations of naval war. To what extent will it pay us in the immediate future to apply the capability of getting under water to each group?

Before considering the effect of submersion on the individual groups of warships certain general aspects of the question affecting all submersible ships require mention. The first general point is that any submerged warship can make use of her peculiar powers in two ways—tactically and strategically.

By the expression "tactical submersion," is meant that the submarine proceeds under water as part of the operation of actually attacking the enemy; by strategical submersion is meant that the submarine goes under water in order to proceed in a secret manner to the place where she hopes to attack the enemy. If an instrument was invented to-morrow which accurately located submarines at a distance of ten miles, then until the submarine develop an antidote there would not be much point in any craft getting under water for tactical purposes. I am not at liberty to disclose the details of the development of underwater detection, but if we take the figure ten as representing either

[1] The official publication giving details of warships is still designated "Steamships of England."

perfect immunity or perfect detection, I consider that from the tactical point of view

in 1914—the Submerged ship was	..	9
the Surface ship was	..	1
1919—the Submerged ship	..	7
the Surface ship ..	..	3
and that 1925 to 1930—the Submerged ship will be		6
the Surface ship ..	..	7

The last figures are of course purely my own estimate; but whether right or wrong, I feel fairly certain that as the art of concealment had a good many years' start on that of detection, so the means of detecting submarine craft have still a certain distance to go before equilibrium is reached, when, of course, the submarine may be obliged to start trying other methods of concealment beyond that of merely disappearing from *sight*. In fact the German practice of running their motors at a synchronous speed was a halting step in this direction.

My conclusion in this matter is that within the next few years we shall see a development of submarine detecting apparatus which will give large and important ships a certain measure of protection against tactical attack by submarine.

Looked at from the submersible ship's point of view, her powers of tactical surprise are likely to be less than they are to-day. Her powers of strategical surprise remaining the same except in these special cases where to reach the open seas she has to pass through narrow channels whose coasts are in the hands of her enemies.

The second general point which concerns all submersible craft is that of the weapons available for submerged attack on shipping.

The only way at present to attack from a submerged position is by mine or torpedo. Both these weapons have occupied the attention of designers for a number of years, whilst methods of underwater defence have only been closely investigated since about 1915. The development of special internal construction, blisters, paravanes and other defensive devices, have considerably lowered the offensive value of mines and torpedoes. It may well be that we are on the eve of a fresh effort by mines and torpedoes in their struggle against ships' hulls, but I do not see any great development impending at the moment in this direction; rather am I inclined to expect under-water protection to continue to develop fairly rapidly for the next few years.

If the submerged ship makes no use of mines and torpedoes, the only alternative known to me is gas.

It is my personal opinion that the use of gas may eventually revolutionize warfare much as gunpowder did when it was first introduced, but this question is outside the scope of the paper.

As far as we are concerned to-day I merely wish to throw out the suggestion that by 1930 experiments may have been made with the object of discharging gas from submarines under water.

The gas might be discharged on to an enemy coastline. I believe there was a proposal to do this from coastal motor-boats on to the

Belgian coast during the last war, but out of deference to Belgian susceptibilities the idea was abandoned. If it ever became necessary to use gas in this manner a submarine would have many advantages as a gas discharger especially if the gas could be made invisible.

I have not at present mentioned the gun as a weapon because a submarine using gunfire can not make tactical use of submersion, she can only use it strategically, i.e., she carries the gun underwater to the selected place on the surface from which it is to fire at the enemy.

The third general matter affecting all submarine ships may be described as "submarine construction."

Some of the requirements of submarine construction are likely to be permanent, others may not be so. Amongst the former are such essentials as a specially strong hull, possessing few openings, easily made watertight. Amongst the latter are the two power units which have to be fitted to all submersible ships built to-day. The use of storage batteries makes the electrical unit remarkably heavy and inefficient.

For instance, in an L class boat the motors for submarine propulsion weigh about 40 tons, the batteries about 130 tons, to which may be added about 15 tons of material incidental to their efficient installation in the submarine.

It would remove a great handicap from submersible ships if they could be built with one power unit. It does not seem fantastic to imagine such a state of things, as the energy for under-water work could be carried in an explosive form, i.e., containing its own oxygen.[1] But this entails exhaust, and this in turn means that unless methods are devised for combining the exhaust gases with sea water the submarine's powers of concealment are lessened.

In peace time when naval estimates are lean, developments in material do not move very quickly and a tremendous amount of experiment would be necessary before a single power unit submarine could be built, and my personal opinion is that submarines will still have two power units in 1930.

Two further technical features common to submerged ships call for mention.

Firstly, the fact that submarines demand stream line shapes all over their hulls: this imposes certain disadvantages upon them as compared to surface ships.

Secondly, the difficulties of manœuvring ships under water when they get very big and especially when they get long.

To dive a very large submarine, unless a static dive is intended, necessitates a considerable depth of water, and once down, when cruising at periscope depth, if the boat takes up a very slight angle, her bow or her stern will break surface, and give her position away.

These facts must be kept in mind when considering the application of submersion to large ships.

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[1] An example is the "Cage" submarine—an American boat—24 hours, 23½ on bottom.

I have now finished my general remarks on submerged ships, and the desirability of making the different types of future warships submersible will now be considered.

First as regards the battleship. In this connection I had intended to examine at some length the relative values of the latest form of surface battleship, such as the "Hood," and a possible submersible ship, which might be designed in the immediate future for battle purposes.

This comparison has become unnecessary, for during the last few weeks two pronouncements have been made on this subject. These statements have an authority far exceeding any that might be attached to my own remarks, and they coincide exactly with my own beliefs. The first pronouncement was made by the First Lord of the Admiralty in an explanatory statement presented with this year's Naval Estimates. He said:—

"There has been some criticism of the maintenance in commission of the present types of vessels, especially in regard to the capital ship. A contrary policy has been openly advocated, this policy being based, it is presumed, on the idea that the battleship is dead and that submersible and air vessels are the type of the future. The naval staff has examined this question with extreme care, and as a result we profoundly dissent from these views.

"In our opinion the capital ship remains the unit on which sea power is built up.

"So far from the late war having shown that the capital ship is doomed, it has, on the contrary, proved the necessity for that type. On the German side the whole of the submarine campaign against merchant vessels was built up on the power of the High Sea Fleet. On the British side the enemy submarines in no way interfered with the movements of capital ships in carrying out operations; destroyer screens, new methods of attack, and altered tactical movements defeated the submarine . . . . History has shown that the introduction of a type to destroy the capital ship has been quickly followed by the evolution of counter-measures which sustain its power. . . . . It is even possible that the present battleship will change to one of a semi-submersible type, or even of a flying type, but such types are visions of the far future, *not practical propositions of the moment.* By gradual evolution and development the types forecasted may arrive, but the immediate abandonment of the capital ship in favour of a visionary scheme of aircraft and submarines, would leave the British nation destitute of sea power and without the means of progressive training."

The second authority was Sir Tennyson D'Eyncourt, who, at the conclusion of his recent paper on H.M.S. "Hood," which he read on March 24th at the Annual Meeting of the Naval Architects, said:—

"But with our present knowledge it would be quite impossible to design a submersible ship which on the same displacement and cost had anything like the fighting qualities on the surface which are possessed by the "Hood." Every ship is a compromise, and if in addition to the ordinary qualities of a battleship, she is required to submerge, or

even partially submerge, a very considerable percentage of weight has to be added to give her this additional capability of submergence. She becomes still more of a compromise, and the added weight must detract from the fighting qualities of the ship when on the surface, so that whatever is done, other things being equal, the submersible ship must be inferior to a surface ship in an ordinary action. There are many difficulties of details in the design of a submersible battleship which would take too long to go into fully now, and, although there is no doubt that submarines are capable of great development, a little thought will make it clear to anybody that if naval warfare is to continue, the surface ship of the line must still hold the field as the principal fighting unit of any great navy. This view is apparently shared by other countries who are developing their navies, and both Japan and the United States are building large capital surface ships."

The next type of fighting ship to be considered is the cruiser.

A cruiser is best defined as any craft which does cruiser duties, and, broadly speaking, these duties may be divided into two sections. Firstly, the duties of cruisers with the battle fleet. Secondly, their duties when working quite apart from the main forces. In the first-mentioned case a very important portion of a cruiser's duty when working with the fleet is reconnaissance. There are various forms of reconnaissance.

We will take first the observation of an enemy's port.

There is no need to labour the advantages to be gained by giving submersion to the cruisers doing this work; the recent war proved conclusively that the submarine cruiser is the best ship for this duty. There are three reasons why this is so.

1. Because the submerged ship can cruise slowly off the enemy's base, and therefore has endurance.

2. Because she can remain close to the enemy's strong forces without tactical support.

3. Because she has a good chance of seeing the enemy without being seen herself. If she achieves this her information is much more valuable to the C.-in-C. The following future developments seem probable:—

Hydrophone Observation.—This will cut both ways.

Our boats observing off the enemy's bases may be able to lay hydrophones right up in his channels, and then listen on the bottom many miles to seaward. It is possible that the hydrophones will be placed in position by coastal motor boats if the waters close to the enemy base are so heavily mined that the submarines cannot get in.

If our boats rely on ordinary visual observation, their greatest difficulty will probably be to get their information away by wireless without the enemy locating them by directional wireless. It may be necessary to establish a chain of boats within close range of each other, so that the information can be passed along at weak strength. If this becomes necessary it would be an interesting parallel to the chain of frigates between the inshore squadrons and the main fleets in the blockades of the Napoleonic Wars.

As regards the defence of our own bases, it will probably be desirable to establish a fairly elaborate system of underwater detecting apparatus within a zone of, say, thirty miles of the base. This system would be worked in connection with aircraft and fast surface craft patrols from a central station on shore.

Doubtless, use will be made of minefields, especially bottom mines, but in my opinion the value of moored mines as a fixed defence against observing submarines may be largely offset by the application to submarines of some form of mine protection, especially as a submarine cruiser on patrol will not want to move very fast.

Net defences, booms and gates will remain with us, and a fleet will always have to lie behind such defences or the observing submarines would soon start using the torpedoes which they will normally carry for the purpose of attacking the fleet on its return to harbour. For if their first duty is to observe, they will probably be ordered not to disturb the fleet on its way out.

These were in fact the orders to our own observation submarines during the last war.

I should like to draw attention at this juncture to the desirability of British fleets being able to carry their own submarine proof defences on their backs. Our fleets may have to fight in any ocean and use many bases, and we ought to have arrangements whereby any squadron can, at short notice and with its own resources, make a base temporarily submarine proof.

As regards other reconnaissance work, such as locating an enemy fleet which has got to sea, or scouting ahead of our own fleet, it is not apparent to me that the advantages gained by using submersible ships for these purposes outweigh the inevitable disadvantages. In the case where it is necessary to sweep out a large area of sea, high speed and visibility are required. Submersible craft have no advantage in this respect over surface craft and are at a disadvantage to aircraft, though submarines may be used in conjunction with the latter, as will be shortly explained. It is also my opinion that the scouting work ahead of a fleet can be more suitably done by surface craft and aircraft. There is another duty of the cruiser with the fleet and that is a tactical one.

This is the delivery of early torpedo attack on the enemy's fleet. It is for this purpose that the K boats were built.

I have mentioned in this paper my belief that when attacking heavily screened modern battleships the submerged ship from the tactical point of view, both as regards her powers of disappearance and her under-water weapon, the torpedo, is likely to remain stationary in development if not retrograde.

Consequently the future of the K boat when used as a weapon for torpedo attack seems doubtful. Personally, I would substitute for them a large type of submarine cruiser with oil engines and very quick diving powers which would be more useful for what may be the main fleet duty of submarine cruisers in the future. This duty is that of shadowing a hostile fleet.

The long range of present-day guns, the development of aircraft, and other factors seem to make it extremely difficult, if not impossible, for surface cruisers to shadow a fleet.

Yet occasions may arise, particularly in our own case, when it will be essential to keep touch with an enemy fleet at sea whilst our main forces hasten up to destroy it.

It is in such a situation that I foresee a possible co-operation between aircraft and submarine cruisers.

Imagine a situation in which it was desired to obtain news of, and bring to action, an enemy fleet if they entered a large area. This might be done by stationing a few submarines at widely separated points in the area, and using in co-operation with them large flying boats or lighter than air ships.

The aircraft would be able to examine large sections of the area, but once they had sighted the enemy they might not be able to maintain touch with him in face of the fighting planes carried in the fleet; our aircraft would report the position of the enemy to the submarine cruisers and the latter would then endeavour to shadow the enemy and report continuously to our main forces.

Submarine cruisers employed on this duty would probably be much harassed by aircraft carried in the fleet, but on the other hand they would have certain advantages.

It would be difficult for the Commander in Chief of the Fleet to ascertain how many shadowing craft were keeping touch with him.

Submarines shadowing a fleet would always exercise a considerable moral effect; the fleet would always fear that the submarines were steaming round its flanks during the night, to lie submerged in the track of the fleet at dawn.

Having briefly outlined the future possibilities of cruiser submarines for fleet work, I propose to examine the influence of submersible ships in connexion with cruiser work away from the fleet. Such work embraces all the cruiser operations which have for their purpose the protection of our sea traffic and the interruption of the enemy's. As our Empire depends for its existence upon a certain minimum flow of traffic across the seas of the world, this matter is of the first importance. In considering the problem contained in the question, "How will our exercise and control of sea communication be affected by submersible craft" it is advisable to be on our guard against jumping to conclusions derived from the result of the last war.

Though we won the war, it was proved that even when we were very favourably situated from a geographical point of view enemy cruisers got to sea in large numbers and destroyed much shipping; most of these enemy cruisers got to sea because they were able to get under water when necessary.

In a future war, if our enemy has an ocean coast line we shall be even less able to prevent his submarine cruisers from getting to sea, than we were during the last war.

In the last war our trade, generally speaking, moved under two conditions. It was either in or outside what was called the submarine zone.

This submarine zone was limited to within a few hundred miles of the coastal waters of Europe.

When the trade was outside the zone it only ran the risk of attack by a few surface raiders, when inside the zone it was protected by special local anti-submarine craft.

Now as the war proceeded the zone enlarged and consequently the strain on the anti-submarine defence was more intense, destroyer escorts had to proceed so far out into the Atlantic to meet convoys that they almost ran out of fuel. Fortunately for us the enemy collapsed, but we must not blink the fact that in the future the so-called submarine zone will be world-wide. This does not mean that every ocean will be full of submarines; no Power would have enough, and it would not be a paying proposition to scatter them over the seas; but what it does mean is that all focal areas where trade must congregate will be infested by submarines, and that all trade will be liable to world-wide attack by the submarine cruisers on their way to and from the focal areas.

There is also this additional fact, that though on an average most of the U boats were small craft, weakly armed, and in many cases afraid of drifters, the later U boats of the U 139 variety were armed with two 6-inch guns. Incidentally this craft in 1918, under the command of Arnauld de la Perrière, attacked a convoy by gun fire, sank two ships, outranged and very nearly sank the armed escort H.M.S. "Perth," as well. The future submersible commerce destroyer will always remain a small ship because numbers of them will be required, and numbers are incompatible with size, but she may easily carry four 6-inch guns, and her radius of action will be not less than 6,000 miles, and more probably 12,000.

Such a craft could be built to-morrow.

These vessels will not make use of their submarine qualities for tactical attack on trade; they will use it for strategical purposes—and they will use it in two ways.

In the first instance we must be prepared to find a concerted attack on our trade taking place in widely separated areas; this attack may coincide with the outbreak of war. Up to the outbreak of war there may be no sign of the enemy outside his home ports, but during strained relations the enemy submarine cruisers may be secretly moving to their war areas.

In the second place the enemy cruisers will make use of their powers of disappearance in the area where they are operating, so as to confuse us as to the number of enemy cruisers in the locality. The careers of the "Emden" and the "Karlsruhe" emphasized the difficulties of locating surface craft, and these difficulties will be still greater when the problem consists in trying to find submersible cruisers.

What is the best way to protect our sea traffic against this menace?

A certain number of operations will take place off the bases from which the enemy cruisers leave and to which sooner or later they must return—though it may be a good deal later than sooner, since the endurance of a submarine of size is very great, and if the use of oil fuel becomes more general in merchant ships the commerce raider may often

be able to refuel from captured ships at sea, an easier operation than that of transhipping a captured cargo of coal.

The value of operations against raiders off their home ports will depend greatly on geographical conditions, and even when circumstances are favourable to us a certain proportion of enemy cruisers will assuredly get to sea.

To counter the operation of these ships our sea traffic must either go under water or move in convoy. The Mercantile Marine being a business proposition will not go under water as long as submarine ships require special hulls, and special machinery. The convoy system, with an escort suited to the new conditions, i.e., world-wide extension of the old submarine zone will have to be our principal measure of defence. In addition to the purely defensive measure of convoy we shall also have to hunt down the cruisers in the area where they are operating.

Future convoy work will be so important and the immediate control of our merchant shipping so insistent if war breaks out, that it is very desirable that close touch be maintained in peace between the R.N. and the Mercantile Marine. It would be good if every master of a steamer of any size were an officer in the R.N.R. who could be given a few days' instruction from time to time on convoy work and similar subjects. We cannot expect to practise convoy in peace time, but there is no reason why we should not be always ready to put it instantly into practice. This act would be the best counter to the possibility of surprise attacks on our trade taking place coincident with the outbreak of war.

I have already suggested that, generally speaking, the future submersible ships will not find their submerging powers of great tactical use to them, having regard to the likely developments of torpedo defences and detecting apparatus; and this will apply especially to the large submersible cruisers. They will not be very handy under water, and as a rule they will not attack submerged. They will do most of their work on the surface, using long-range gun fire.

The most successful of all U boat commanders, Arnauld de la Perrière, held that this was the best way of attacking trade.

If these views are correct, the convoy must be protected from this method of attack.

I wish I could think of some brilliant means of defence other than the very obvious one of giving the convoy an escort capable of fighting the submarine with her guns, but I must confess I can not do so.

It seems to me that if we want to give our future convoys adequate protection against submarine cruisers we have got to build a class of ship capable of doing the work.

My idea of such a ship is a vessel of about 20 knots maximum speed, with oil engines giving her big endurance and no smoke, of 3,000-4,000 tons displacement, carrying four 6-inch guns, or if potential enemy submarines mount heavier armament, then the convoy escort class must follow suit. She would be fitted with the best detecting apparatus and be supplied with the latest anti-torpedo protection, such as blisters, etc.

She would also carry a copious supply of depth charges and a battery of throwers.

Finally, it is of the first importance that she carry at least one aircraft, provided arrangements can be made for the aircraft to return to the convoy ship—perhaps the Helicopter will permit of this.

If some of the big ships in the convoy can carry aircraft so much the better. It should be considered whether an arrangement can be made with shipowners to construct their ships so that in war they can be fitted with a temporary landing platform; for in the future it may be very desirable to arm merchantmen not only with guns but with aircraft.

The duty of the aircraft with a convoy will be to scout ahead during the day time and sweep astern at dusk, the latter operation in order to see if the convoy is being followed by an enemy desirous of making a night attack.

In any case the important point will be to sight the enemy on the surface as far away from the convoy as possible.

If circumstances permit the convoy will then be diverted whilst other forces are called upon to attack the enemy.

If the convoy must pass near the enemy, the convoy escort ship should tackle the submarine and hunt her until the convoy is safe, the latter making such use of smoke screens, etc., as is possible. I have not lost sight of the fact that to construct a class of convoy escort ship takes what we are all short of—money.

It may be urged why not arm selected ships in the convoy, and arm them sufficiently strongly to beat off the submarine attack. My objection to this proposal is that the defence of convoys is so important a matter to us, that the escort ship must be designed primarily to fulfil that duty.

Officers who served in destroyers during the last war will remember what happened when the destroyers had to be turned into ships suitable for other duties. There was a danger that in endeavouring to make a destroyer fulfil three duties, a ship was produced that would do none.

By all means let the possibility of using the convoy escort class for trade purposes in peace and war be borne in mind and considered, but let such consideration be secondary to the decisions as to the necessities for defeating the ocean-going submarine.

In addition to the more or less passive defence obtained by convoys, active operations will be required with the object of hunting down the enemy cruisers.

In the past a recognized method of attacking enemy surface cruisers which have preyed on sea traffic has been to establish offensive patrols in focal areas.

This principle will still hold good, but the method of applying it will be different. It will be useless to order a surface light cruiser to patrol, say off the Cape of Good Hope, if enemy submarine cruisers are attacking trade in that area.

I suggest that the best way of attacking such enemies will be by a combination of aircraft and our own submarine ships.

If the area is near one of our own bases the use of heavier than air craft seems indicated, if the area is far from a base large airships might be employed.

The principle of operation might be as follows:

The aircraft being able to examine large areas in a short time would scout for our own submarines. As soon as the aircraft sights the enemy, in all probability making him dive, the aircraft calls up our nearest submarine. Sooner or later the enemy must come to the surface to charge his batteries, and he is almost certain to do so at night.

There seems a possibility that under favourable conditions this operation might be made hazardous for the enemy if the airship could periodically illuminate several square miles of sea.

Next day the enemy will be sighted again by the airship if he surfaces, and he will then also run the risk of being torpedoed by our own submarines, which by this time should be close at hand, The other alternatives then open to the enemy are to dive, or else vacate the area. In any case as long as the submarine cruiser is on the surface she will probably be seen and reported by the aircraft, and once a cruiser operating against trade has been reported it is time for her to move elsewhere.

The use of our own submarines in an area for the purpose of destroying the enemy submarine cruisers has the following advantages:

1. Submarines having large endurance, our boats could cruise for prolonged periods in the area.

2. If we endeavoured to use surface craft such as the American chasers, we must fit them with guns, approximately equal to those carried by the submarine cruiser. This would make the chaser rather large and she would then run a risk of being torpedoed.

3. The greatest moral effect would be produced on the enemy if we used submarines.

The U boat commanders disliked our offensive submarine patrols more than any other anti-submarine measure. There is something peculiarly unsettling in the feeling that a submarine is stalking one. When on the surface no relaxation of vigilance is permissible and even when submerged a hydrophone duel may be in progress.

An enemy cruiser submarine knowing that she had been seen by the aircraft might suspect that other forces bent on her destruction were at hand. As long as the horizon was clear there would be no danger from surface craft, but her fear of submerged attack would be continuous.

To get the best results from our submarines it would be desirable to design a special type of boat for this work.

Her qualities should include:

1. Very high endurance.
2. Good methods of communication with aircraft.
3. Crew accommodation suitable for the tropics.
4. Either a torpedo armament, or a big gun to be used on torpedo lines, i.e., the boat to surface at short range and fire one shot with a flat trajectory.
5. A bow meant for ramming.
6. Good manœuvring powers on the surface.
7. Depth charges and throwers.

If some such scheme of combined operations between aircraft and submarines is the best way of dealing with enemy submarine cruisers in focal areas a number of our small possessions overseas may become exceedingly important as bases from which our combined patrols will work. Ascension and St. Helena, for example, may have their cliffs crowned with airship hangars. This concludes my general survey as to the value of applying submersion to cruisers, both for fleet work and for duties away from the fleet.

There remains one group of war vessel to be examined—those ships which I classed as auxiliaries. By such ships are meant:

1. Minelayers.
2. Special torpedo-carrying craft.
3. Monitors.

Within the limits of this short paper it is only possible to deal very briefly with each of the foregoing types.

First as regards Minelayers.

A submersible minelayer has the strategical advantage common to all submersible ships of being able to evade action with our main forces during passage from her home ports to the scene of her operations.

Her tactical advantage, if she is kept small, is that she can lay her mines close into harbour entrances. A good example of this took place in the last war when E 45 laid her mines from the surface in the gate entrance off Heligoland in 1918.

It was a dark but clear night and the captain of E 45 told me afterwards that whilst they were laying their mines they had listened to some German sailors singing songs on the forecastle of a guard ship about three hundred yards away. The disadvantage of the submarine minelayer is that she carries such a small cargo. In a future war, if we are able to prevent surface enemy minelayers from getting out of their bases we must expect to have small minefields laid by submersible ships in the entrance to our chief ports such as Sydney, Melbourne, Cape Town, Calcutta, Bombay, etc.

The only difference in this aspect of war against our trade between past and future is that in the future we must expect these small minefields to appear all over the world. Submersible minelayers will always be of some value to our enemies, who will generally be carrying out extensive operations against our sea trade—that trade which is our strength and our weakness. From our point of view the value of submarine minelayers will depend a great deal on the geographical situation of our enemy, possibility and value of minelaying off his bases, etc. The next auxiliary is:

Special torpedo-carrying craft.

Concerning the use of these for fleet action purposes, I have stated my reasons for doubting whether within the next ten years the type of submarine destroyer of which the K boat is an example is going to be of much use.

But I suggest that if geographical circumstances are favourable to their employment, our enemies may use small handy torpedo-carrying submarines for attacks on our sea traffic. This attack might be useful

to our enemies in an area which was too strongly patrolled to admit of the big cruiser submarine carrying on a gun attack.

From our point of view the main use I see for the torpedo-carrying submarine is for patrols against enemy submarine craft.

The next type is *submarine monitors.*

These seem more likely to be useful to our enemies than to ourselves. I have suggested that the protection of our sea traffic in a future war will entail the use of a considerable number of isolated bases used by our submarines and aircraft. If these bases are not adequately defended by guns they might be bombarded by submarine monitors which have evaded our main forces.

There should be plenty of guns left over from the last war to defend every base we shall require to use. And all over the Empire, for at least ten years, the ex-artillery man will be found.

It is difficult to imagine a submersible monitor carrying out an accurate bombardment unless she remains on the surface, that is to say, that strategically there is a gain by applying submersion to a monitor, tactically there is a loss.

These auxiliaries, minelayers, torpedo carriers and monitors seem to me the only three to which submersion may be applied in the immediate future.

I think that at present submarine transports, or submarine aircraft carriers, except in so far as a commerce-destroying submarine might have a small seaplane, are rather fantastic.

I might perhaps have mentioned submarine supply ships, but the use of such craft would be automatic on the part of a Power whose over-sea submarines found it too dangerous to work from home ports.

The summarized conclusions of the arguments in this paper are as follows:—

1. As regards the general principle of making use of submersion in naval war. It is thought that from the point of view of actually attacking ships from under water the advantages of the submerged ship are not within ten years likely to be as great as those enjoyed by U boats between 1914-16; and if methods of detection and underwater defence make normal advances the tactical advantages of the submerged ship over the armed surface ship may in the near future be a good deal less than they were in 1919.

Strategically, the advantages of submersion are great, and as constructional difficulties are overcome and we are able to apply submersion to additional classes of ships without sacrificing other essential qualities, the strategic influence of submersible ships in naval war will increase in a corresponding manner.

The actual developments to be expected during the next ten years are thought to be as follows:—

1. *The battle fighting ship.*

It will not pay us to try and give this class of ship submarine qualities.

2. *The Cruiser.*

Cruisers intended for observation work off enemy ports must be of submarine type.

Cruisers watching areas in which it may be necessary to shadow enemy fleets must be of submarine type. Cruisers employed on screening and scouting duties with a fleet will be of aerial and surface type, working in co-operation.

Cruisers employed on guerre-de-course will be of submersible type and they will destroy shipping by gun fire. These craft are particularly suited to our enemies and appear to me to be the greatest future naval danger of the Empire.

Cruisers employed against these raiders must be of aerial and submarine type, working in conjunction.

If a potential enemy is known to be building these commerce-destroying submarine cruisers it is suggested that we should lay down a special class of ship for convoy escort in time of war.

The Auxiliaries.

The submersible minelayer will not have a general value to us, but might be useful if we went to war with certain Powers whose geographical situation was such that inshore minelaying would be profitable. To our enemies the submersible minelayer will be useful for mining in the entrances to our commercial ports as part of the campaign against our sea traffic. The same remarks with the substitution of the word "bombardment" for minelaying apply to the case of the *submersible monitor.*

The torpedo-carrying submersible.

For fleet action purposes she is only likely to be of marked use for covering the retreat of a defeated fleet. It is suggested that the K boat class will die out for the time being if the view is correct, as expressed in this paper, that the tactical advantage of submersion is on a temporary decline.

DISCUSSION.

ADMIRAL MANN: I rise only to start the discussion. As an old retired Admiral I am not qualified to criticise so technical a subject. It records the view of a young officer who has gained his experience during the great war, and we all congratulate him on writing such an excellent paper. It shows that initiative is now encouraged in a way we old fellows never dreamed of. We were not allowed to think in the days when I was a lieutenant. We had to obey orders, follow the routine and carry on. This is a serious matter, and I hope now other young officers will come forward. I am sorry the lecturer's father was not able to be present to hear his son read his paper; he may well be proud of the way he has collected his ideas and put them into form. But I see his uncle here, who I am sure is well pleased with his nephew. This Institution gains by having him as a member. He has already won the Gold Medal, which proves him to be a thinking man, and now has again placed before us matter for serious consideration.

CAPTAIN P. WORTHINGTON, R.A.F.: The author lays considerable stress on the co-operation of aircraft and submarines, and one great essential, as it seems to me, for such co-operation is that the aircraft must have very considerable endurance. In one case in point he suggested the use of large airships with anti-submarine cruisers, but it is quite impossible for any aircraft as at present known to endure weather which a submarine can stand. There is only one

craft at the present moment which will do it, and that is the kite balloon. Some very interesting experiments were carried out at the end of the war in fitting a winch on a "K" class submarine. I should think that therein lies the development of the future co-operation between aircraft and submarines, in the shape of small non-rigid airships, which can be towed by the submarine or which can operate under their own power. They would then have all the endurance of the kite balloon and could manœuvre independently of the submarine. It is a difficult problem to be solved aerodynamically, but a certain amount of progress has been made already. For convoy work a convoy ship should be certainly fitted with a kite balloon, as it will give continuous observation against the enemy. In the war it was demonstrated on the "Cambrian" that it was possible for balloons to endure for 2,500 miles continuously in face of a wind of up to 80 knots.

COMMANDER BELLAIRS, M.P.: I should like to congratulate the author on the exceedingly able paper he has read to us, a paper which I am sure will be very much discussed in the future. One reason why we have had very little discussion here is that the paper only just came into our hands to-day, and another reason is that the Active List officers of the Navy are very shy of coming here. I wish we had one or two Sea Lords of the Admiralty here, because we could tell them things. I believe the Admiralty are very favourably disposed to discussion now, but the Navy recollects the fact that for about twelve years discussion has been damped down, and therefore the Active List officer does not come here, and now we have to get him here. After all, we who have retired from the Navy become obsolete in two years in our material knowledge; we have lost touch with it. With regard to the paper, I am very glad that the author confines his forecast to a period of about ten years. At the beginning of the war I made a collection of the forecasts of Mr. H. G. Wells—unfortunately I lost them, but at the time when Liège was being besieged Mr. Wells said the Germans had lost the war. It shows that a man who can make forecasts of the distant future is not a practical judge of the immediate future. In confining his forecast to ten years the author takes a period which is a very good one. Everything points to ships becoming obsolete within a period of about eight years, and I believe the Japanese programme is based on that assumption. There is only one possible fault which could be found with the paper, and that is that the author rather lays out a big plan which will cost a good deal of money. He himself refers to the fact that we are in for lean times, and, as a politician, I must point out that his assumption is perfectly true; we are likely for several years to come to be in for very lean times in regard to the Navy. The idea that it is necessary to carry out very elaborate experiments was borne out by very elaborate experiments extending over several years before oil fuel was introduced into the Navy. Undoubtedly lean times lie before us, and the Navy will have to adopt old material as best it can, and to that problem it would be very wise for the Navy to address itself—especially for convoy work—rather than designing brand new ships for that purpose. The author speaks of utilizing the old guns all over the Empire, and says that plenty of artillerymen will be found to man them. That is true, but it will cost a great deal of money to adopt old guns and mount them on shore. I think we shall have to run more risks in that direction at any rate, because you can divert a very large sum of money towards shore defences and not reach finality. That is one caveat I should like to enter against the proposal to put up big shore defences all over the Empire because of the submarine menace. I congratulate the author on his paper, I think it will provide subject for discussion for some time to come, and I hope many young naval officers will follow the example of the author and give us papers at this Institution.

LIEUTENANT KING-HALL: I have listened with a great deal of embarrassment to the quite undeserved praise handed out to me. The first practical point that was brought up was the question of kite balloons and submarines. I did not quite gather whether the suggestion was that a kite balloon should go with a submarine. There would appear to be a difficulty as to what would happen when the submarine dived. However, I followed the argument as to the small airship. I am aware that experiments are in progress, but I have no knowledge whatever as to what has been arrived at from those results. As regards the amount of weather airships can stand, I have no special technical knowledge, merely having read about it. The only bad weather I know of is the bad weather experienced by our airship when she went to America a few months ago and met a wind of 70 miles an hour at one period. The question of small balloons which could be detached from the submarine and proceed on their own power seems to be one well worthy of investigation. I consider the chief disadvantage of the suggestion that the escort ship should have kite balloons instead of aircraft is that whenever the submarine sees a kite balloon, which is a more or less easily recognized body, it would know it was attached to something, and ultimately the kite balloon might give away the position of the convoy. That was an objection raised in the war by convoy people. There was a good deal of discussion, and the objection to kite balloons was that, while they might enable the convoy to see the submarine, they certainly enabled the submarine to see the convoy. The advantage of having aircraft operating independently from the escort ship is that she can scout the sea out of sight of the convoy altogether, and either report by flying back, if wireless silence is necessary, or report by wireless and inform the convoy of the presence of a submarine in a definite area, and possibly enable the convoy to steer clear of that area. Unless the aircraft makes the mistake of rejoining the convoy on a direct course, it should be possible for it to rejoin the convoy without giving the submarine any indication as to where the convoy is. With regard to the point raised by Commander Bellairs, I know it is very unpopular and probably very unwise to suggest any new construction at the present moment. I was rather looking at it from the point of view that these would be my suggestions if I were asked what I thought would be required, and I should then wait to see how much money the political gentlemen would give me. I understand there is more or less agreement amongst all parties that a certain sum of money will be spent annually on the Navy as part of the insurance premium of the British Empire. I considered carefully the question as to whether it was really necessary to build a special convoy escort class, whether one could not do something with the merchant ships we already have. I think we had a fairly good example during the war of the sort of thing that happens when you have to make shift. I do not know whether any destroyer officers are present, but if any are, who towards the end of the war were in destroyers which were primarily built to attack the enemy's fleet, but had been turned into submarine-hunting ships and convoy ships loaded up with all sorts of patent apparatus, I am sure they had some bitter things to say upon the subject. Suppose we took the South African trade and make arrangements for the Union Castle liners to be armed with a certain number of guns when war breaks out, can we be absolutely certain that when war breaks out those ships will not be seized to send an expeditionary force to some part of the Empire? If we have escort ships specially built they will be naval ships and earmarked for convoy work. In peace time it should not be impossible to make use of them on cross-Channel ferries, and in war time they could carry cargo, but the first consideration should be the defence of the convoy.

THE CHAIRMAN: I believe I shall voice the sense of the meeting in proposing a vote of thanks to the author, and in doing so I will make a few remarks on the paper. First of all I congratulate the author on having collected the facts and put in a very clear form the situation of submarines in the future, and not only putting it in a clear form but doing so in a very practical manner, recognizing their advantages and disadvantages. I should like to congratulate him on having written his paper before the First Lord's statement was issued. It is very creditable. The matter had been under the consideration of the War Staff of the Admiralty, and a lieutenant writes a paper beforehand which practically coincides with the War Staff views; it is a great compliment to him. I think the table he gives on page 4 of his paper is very interesting and it is a very true one, showing that the submarine is going back in one sense but is still a menace in another. I think the conclusions he has formed are very sound, and I quite agree with Commander Bellairs about the ten years' life of ships, because it is no use looking too far ahead. I am pleased the author does not recommend battleships being submerged. I think that is quite impracticable and very undesirable, because a ship that comes to the surface for a short time will not make any correct aim. I hear a good deal of talk about the "Hood," as one heard a good deal of talk about the first "Dreadnought." A battleship is not a unit of a battle fleet, the unit of a battle fleet being four ships. If one submarine came up to attack four "Hoods" I think she would soon meet her fate. As the size of the submarine gets larger it becomes a big torpedo target, and that limits the size of a submarine. It is most important that the three forces, surface craft, the submarine craft, and the aircraft, should work together in absolute sympathy and co-operation. No doubt aircraft will be of great assistance. They have been of great assistance in the war, and will be of greater assistance in the future for reconnaissance purposes and I have no doubt that aircraft will be of great assistance for reconnaissance purposes in connection with convoys. I rather lean towards the author's views about kite balloons. We had them in the Grand Fleet, and I think they were a mistake, because they marked the Fleet. If you mark a convoy it is a disadvantage. Sometimes they got blown away and sometimes we could not haul them down. Still, it was a development. But if an aeroplane can go off a battleship deck and come back it is far better, as an aeroplane can scout over a larger area and does not mark the convoy. I think the paper is a very hopeful sign for the British Navy. It shows that the submarine is not the menace that some people want to think it is. Of course it will always be a menace. I believe why this menace has affected this country more than any other is that we have always used a wrong term in talking about "the command of the sea." We have never had command of the sea. It would have been truer to have used the term "control of the sea." Whenever one goes to war it will be found that the British Navy or any other navy has never commanded the sea so long as the hostile nation can build a ship: that is, until every enemy ship is destroyed one cannot have command, but you can have control, and that is all one can expect in a maritime war. I should like to address a remark to Commander Bellairs, as he represents the House of Commons and the Estimates. We are living in lean times, and rightly so, in order to establish our finances, but remember you can establish your finances and yet lose your stability, and it is no use losing your stability by not having an adequate Navy, because without an adequate Navy one soldier cannot be sent across the sea, and therefore England might be found with, say, an Army of 5,000,000 men that cannot be sent across the sea, starving. I am sure all will agree with that. I do think it is a good thing to get a true perspective and see how much is the least you should spend to ensure the stability of this great State and Empire.

With regard to the use of old material, we have tried old material in the war and the war tried the old material severely. If one is outranged by the gun one cannot do much. A submarine will carry the latest gun, which will outrange the old material altogether. I thoroughly agree with Commander Bellairs on the question of shore defences. Our trouble in this war was that the Navy was sufficient to protect the country from invasion, but the Navy, even with the Allies, was not sufficient to protect the trade of the country from damage. Therefore that is the first requirement, and accordingly sufficient guns must be allotted to floating defences before shore defences. With those few remarks I ask you to pass a hearty vote of thanks to the author. I hope his paper will be thoroughly read and will be digested by everybody, Parliament included.

The motion was carried unanimously.

ADMIRAL MANN: I have been asked by the Secretary to propose a hearty vote of thanks to Admiral Sturdee for presiding here to-day, which I am sure you will accord to the victor of the Falkland Islands action.

The motion was carried with acclamation.

GENERAL JOFFRE'S PLAN.

Introductory.

THE November, 1919, number of *Les Archives de la Grande Guerre* contains an interesting memorandum which was read by Marshal Joffre to the French Parliamentary Commission which inquired into the causes of the evacuation of the Briey basin. In the course of his evidence, he traced the history of the French plan of operations in the event of a war with Germany, and described the movements of the French Armies from the outbreak of war to the battle of the Marne from the point of view of the Generalissimo. The causes that led to the evacuation of the valuable mine area of Briey are not far to seek. It lay close to Metz and almost under the fire of the fortress batteries, so that the occupation of Briey involved the investment of Metz. The situation at the outbreak of hostilities made such an operation impracticable and "when the fate of the French Armies and even that of France itself was in the balance, it was no time to think of Briey." Such is the gist of the evidence so far as the Briey basin is concerned, and there we will leave it. The following summary attempts to give the main outlines of Marshal Joffre's memorandum in its references to the mobilization and operations of the French Armies up to the end of the battle of the Marne. The memorandum has naturally considerable historical value; although some of the statements made seem hardly susceptible of proof, and do not agree with the official ones in "Quatre Mois de Guerre 2 aout—2 décembre 1914." It was undoubtedly drawn up after events.

I.—The Plan of Mobilization.

The plan of mobilization which was in force at the outbreak of the war dated from the spring of 1913. In that year it was found necessary to make entirely new dispositions, due quite as much to the improvements in military armaments and to the need for taking full technical advantage of the railway systems, as to the changes in the general European situation. The new plan that was conceived, and named Plan 17,[1] was placed before the Supreme War Council on April 18th, 1913, and approved by the Minister for War on the following May 2nd.

It required a re-organization of the reserve formations, in order that they might in future be employed at once by the side of the regular units, instead of being at first kept far behind the front, as in the former mobilization plans. At the same time, the number of reserve divisions was increased from 22 (Plan 16) to 25 (Plan 17).

[1] Plan 1 is dated 1875, and was followed by others, some of which had variants; for example, 16 *bis*, 16 *ter*.

The centre of gravity of the forces in the north-eastern zone was moved considerably further north than in the preceding plans, owing to the possibility, which was regarded as more and more probable, of the violation of Belgian territory by the German Armies. Previous to Plan 16, the concentration was to take place south of Verdun; in Plan 16 it moved slightly northwards, and in the Plan 16 *bis* further north again, as far as Mézières. Finally, in Plan 17, it was placed a great deal further north and, in addition, the forces on the northern flank were greatly increased.

The general dispositions provided at the outset for 18 corps and eight reserve divisions (distributed among four Armies) on a front between Belfort and Hirson. These formed the first line. The second line consisted of three corps in the area St. Dizier—Bar le Duc, though an alternative concentration area was also given for this Army, so that it could be formed further to the north if it was deemed necessary to shift the centre of gravity further in that direction. In addition to the above formations, the Generalissimo would have at his disposal various groups of reserve divisions and a certain number of active or reserve divisions, including the divisions from Algeria and the Alpine Corps.

Plan 17 made full provision for covering the concentration so that the Armies might carry out their detrainment, concentrate and, if necessary, begin to take the offensive without any molestation on the part of the enemy. In this respect, Plan 16 had contained two faults. First, the weakness of the force detailed for the purpose of *couverture*, and secondly, the allotment of too extensive sectors to the three frontier corps, which had to carry out this all-important task. The new plan arranged the territorial areas so that five of them lay along the frontier, and thus at the beginning of mobilization the covering duties would be allotted to a force of five frontier corps, with Cavalry divisions at their disposal. These would be reinforced on the fifth or sixth day of mobilization by three Infantry divisions. Moreover, the new Recruiting Law enabled the five frontier corps to be kept almost on a war-footing. These five corps were the VII., XXI., XX. (Nancy), VI. (Verdun), and a division of the II. Corps.

The covering force was to take up its position closer to the frontier on the whole of the front than was required in the previous plan, owing to the desire of the Higher Command to reduce to a minimum the area of French territory that the Germans might seize by a sudden offensive. From the fifth day of mobilization, the commanders of the First, Second, Third and Fifth Armies were to take over the sectors occupied by the covering force on the front of their Army-zones. The covering troops were to occupy a certain number of temporary defence works, which would enable them to hold out for some time against superior forces. These defence-works, according to Plan 17, were to be constructed immediately on mobilization, near Montmédy, on the Hauts-de-Meuse, on the Grand Couronné de Nancy, and at the exit of the Forêt de Charmes. The nature of these defence-works had been worked out in detail in peace-time. Some of them, notably those on the Grand Couronné de Nancy,

had even been begun several months before mobilization, starting with the most urgent ones, those along the line of resistance, and leaving the advanced works, which were of secondary importance, till afterwards.

II.—The Plan of Operations.

Once the plan of mobilization had been approved, the plan of operations could be proceeded with and prepared in detail by the General Staff.

The general idea of this plan was, in view of the strength of the German forces, that battle should only be accepted against them with the full available strength along a united and thoroughly organized front. If isolated units became engaged prematurely, there was always the risk of their being defeated in detail. Success, therefore, could only be obtained by combined action, and for this, in the first place, a complete concentration of all resources and their organization on a united front was essential.

In the Battle of the Frontiers, just as in the Battle of the Marne, this idea was always kept strictly in view, and although the former, for reasons which will be discussed further on, failed, the principle was brilliantly justified by the success in the latter.

The intention of the Commander-in-Chief, therefore, whatever the circumstances, was to take the offensive against the German Armies with the whole of his forces on a united front.

The action of the French Armies was to take the form of two main operations. One was to be developed on the right, in the area between the forests of the Vosges and of the Moselle below Toul, the other on the left, north of a line Verdun—Metz. These two operations were to be kept in close touch with one another by the troops operating on the Hauts-de-Meuse and in the Woëvre.

The directions for the concentration make no mention of the position eventually to be reserved for the British Army, and for obvious political reasons it could not be actually stated. The military agreements, says the memorandum, with England were in fact both secret and uncertain, so that any reference to them in such documents was impossible. Nevertheless, the co-operation of the British Army had been worked out in full detail. The necessary arrangements had been made for its disembarkation and its concentration; its place in the line had been fixed where it logically should be, that is, on the left of the French Armies, and prolonging their front.

The main outlines of the concentration, the duties of the various armies in accordance with the general idea already mentioned, and the necessary instructions for carrying out these duties were filed in one dossier, which in peace time was handed to each of the Army Commanders concerned, so that he should clearly understand what was required of him, and be ready to act immediately on the declaration of mobilization, without the need of calling a conference of the Army Commanders.

III.—The Battle of the Frontiers.

On the morning of August 2nd, German troops crossed into Luxembourg, and on the night of August 3rd-4th, the German advanced guards entered Belgium.

As soon as this was known, and it was immediately, thanks to the intelligence service, it formed the basis of important decisions.

On August 2nd, that is to say, on the very day of the declaration of war, it was decided to use the alternative concentration areas for the Fourth and Fifth Armies, and consequently to extend the left wing towards the north, and move the centre of gravity of the French Armies in that direction.

On the 3rd, the Cavalry Corps advanced east of Mézières, and on the 5th it was ordered to enter Belgium "to determine the apparent front of the advance of the enemy and to delay his columns."

Between the 6th and the 8th it became known that a German Army, in which units belonging to five different corps were reported, was marching on Liège, and was engaged with the Belgian troops. The main group of the German Armies appeared to be around Metz, in front of Thionville and in Luxembourg. It was in a position to advance westwards if Liège fell, and extend the movement to Brussels and beyond. In the event of Liège holding out, it was, however, in a position to wheel southwards and employ its full strength against the French frontier, between Metz and Namur, pivoting on Metz.

After thoroughly considering these facts, a decision was made and communicated to the French Armies on August 8th, "*de rechercher la bataille toutes forces réunies, en appuyant au Rhin la droite du dispositif.*" (General Instructions No. 1, of the 8th August, 7 a.m.). It was also mentioned in these instructions that the left of the line would, if necessary, be drawn back to avoid a premature engagement which might be decisive for one of the armies before the others could come to its support; on the other hand, the left would be advanced should the enemy's right be delayed in front of Liège or turn southwards.

At that time, it was still too early to give detailed orders as the concentration did not begin till the 5th, and would not be finished till August 18th.

During the period from the 14th to the Battle of the Frontiers, on August 21st, events gradually developed and confirmed the original general idea of the operations. The intention was to deliver the principal attack with the forces on the left, and these had, therefore, to be strengthened as much as possible at once.

This was provided for by a series of measures, concluded by August 16th. Thus the Third Army was increased by the 65th Reserve Division (two more were added to it on the 21st and 23rd August). The Fifth Army was reinforced by the 37th and 38th African Divisions, the 4th Group of Reserve Divisions, and the XVIIIth Corps taken from the Second Army. The Fourth Army received the Moroccan Division from the Third Army.

On August 21st the general plan of operations, after being adapted each day to the situation, finally took definite shape. Broadly speaking, the intention was to make the principal attack through Luxembourg and Belgian Luxembourg, thus threatening the communications of those German forces which had crossed the Meuse between Namur and the Dutch frontier; this duty devolved on the Fourth and Third Armies to carry out. The First and Second Armies were to make a secondary offensive between Metz and the Vosges, to hold the enemy, who seemed to be gradually shifting westwards and who might otherwise be able to take in flank the French Armies attacking in Luxembourg. Lastly, leaving only a screen along the front of the Ardennes, the German forces advancing from the Meuse were to be held in check for sufficient time to allow the attack of the French Armies in Luxembourg to become effective: this was the duty assigned to the three Armies on the left wing, the French Fifth Army between the Sambre and the Meuse, the British Army near Mons, and the Belgian Army, which was to get into touch with the British.

The intended offensive, however, did not succeed. This was not because the enemy was numerically superior, for the various measures already mentioned would have enabled the French Armies to accept battle on almost a numerically equal footing with the German Armies[1] and with an approximately equal distribution of forces, that is to say, a third between the Rhine and a line Verdun—Metz (inclusive), and two-thirds north of a line Verdun—Metz; but the disadvantage lay in the fact that the Allied left wing, faced by the best units of the German Army, was "composed of incongruous (*disparates*) forces of dissimilar value (British Army, Belgian Army, etc.)." Another reason for the failure was that the fighting force as a whole did not obtain the results expected from it. There were many signs of weakness among the higher commanders, so that some of the large fighting units were surprised or badly disposed for battle and broke up very rapidly, exposing the units on either side of them to heavy losses. It was therefore necessary to remove immediately many of the officers concerned from their commands, in order to prevent any repetition of such disasters.

IV.—From the Battle of the Frontiers to the Battle of the Marne.

The Battle of the Frontiers was a failure. The French Second and First Armies, by taking the initiative at the outset, had saved Nancy and covered the French right in the Vosges, but the Third, Fourth and Fifth Armies had to yield to pressure. The Fourth Army made a successful counter-attack against the corps of the German Fourth Army advancing from Sedan and drove them back on the river, but, further north, the German First Army was moving down freely (*libre de ses mouvements*) through Belgium by forced marches, leaving the Belgian Army in Antwerp.

[1] Note in Memorandum: The Germans had 85 infantry divisions and 10 cavalry divisions: the Allies had 83 infantry divisions and 12 cavalry divisions.

The British Army withdrawn (*se replie*) and the roads were thus open for the advance of the three German Armies of the right wing.

It was now necessary to regroup the Allied forces in such a manner that the danger of envelopment might be avoided, and at the same time to recover as far as possible the initiative.* To do this a French Army would have to be formed on the western flank of the British Army and the whole left wing much strengthened.

This new operation was planned on August 25th and its foundation laid in the "General Instructions No. 2 of the 25th August" as follows: "*La manœuvre offensive projetée n'ayant pu être exécutée, les opérations ultérieures seront reglées de manière à reconstituer à notre gauche par la jonction des 4e et 5e armées, de l'armee anglaise et de forces nouvelles prétées dans la région de l'est, une masse capable de reprendre l'offensive, pendant que les autres armées contiendront pendant le temps nécessaire les efforts de l'ennemi. Dans son mouvement de repli, chacune des 3e, 4e, et 5e armées tiendra compte des mouvements des armées voisines avec lesquelles elle devra rester en liaison.*"

The general line from which the offensive movement would begin had its right (the Third Army) resting on Verdun; it then ran along the Aisne, and thence, by Craonne, Laon, La Fère, the neighbourhood of Moy, St. Quentin, Vermand, and the Somme from Ham to Bray. The new force, which was to be formed near Amiens, was to consist of the VIIth Corps and the 63rd Reserve Division from Alsace, the 55th and 56th Reserve Divisions from the Army of Lorraine, the 61st and 62nd Reserve Divisions from the fortress of Paris and, finally, of the IVth Corps from the Third Army, and of the 45th Infantry Division just arrived from Africa. This force constituted the Sixth Army, and was placed under the command of General Maunoury, who brought his Staff with him from the Army of Lorraine.

The Cavalry Corps was sent to the left of the Sixth Army; and from Picquigny, on the Somme, to the sea a barrier was formed and held by French Territorial Divisions against any inroads of the enemy's cavalry.

The plan, as laid down in "Special Instructions No. 19 of the 27th August," implied an offensive of the Sixth Army in a north-easterly direction against, and enveloping, the enemy's right.

Circumstances, however, did not allow this plan to be carried out as it was originally intended. The retreat of the British Army was much harassed[1] by the enemy, and on the 28th he was threatening the detrainment area of the Sixth Army. A counter-attack made by the Fifth Army near Guise on the 29th gave breathing space to the British Army and to the Sixth Army, but not sufficient for the latter to complete its concentration in the area allotted. Since the essential condition for success was the close co-operation of the Allied Armies on a combined front, a further withdrawal had to be ordered. The Fifth Army was to go back to behind the Serre, the Sixth Army to retire on Paris, which it was to cover, and Rouen was given as the line of retreat for the Territorial

[1] Only up to the Battle of Le Cateau, August 26th.

Divisions on the left wing. The British Army was to retire by the east of Paris behind the Marne, between Meaux and Neuilly sur Marne, afterwards moving westwards and south of Paris.

Thus the outflanking movement by the enemy against the left of the Fifth Army, which was not sufficiently checked by the British and the Sixth Army, necessitated the whole line being withdrawn, pivoting on its right at Verdun. The limits of the withdrawal were laid down in the "General Instructions No. 4 of the 1st September":

"On peut envisager comme limite du mouvement du recul, et sans que cette indication implique que cette limite devra être forcément atteinte, le moment ou les armées seraient dans la situation suivante: un corps de cavalerie de nouvelle formation en arrière de la Seine, au sud de Bray; 5e armée en arrière de la Seine, au sud de Nogent sur Seine; de la 4e armée detachment Foch, en arrière de l'Aube et le gros en arrière de l'Ornain, à l'est de Vitry; 3e armée au nord de Bar le Duc."

On September 2nd further instructions were given that in case the re-grouping of the Allied Armies could not be carried out on the line mentioned, the Armies might be withdrawn to a general line Pont sur Yonne—Nogent sur Seine—Arcis sur Aube—Brienne le Chateau—Joinville. The actual plan of battle remained unaltered, and the British Army was asked to take part in it by holding the Seine between Melun and Juvisy, and by advancing on that front when the Fifth Army took the offensive, whilst simultaneously the garrison of Paris was to operate in the direction of Meaux.

On the morning of September 4th, however, the situation became more favourable for carrying out this plan, and the Allied forces were now sufficiently re-organized to enable the Fifth Army to escape the enemy's enveloping movement against its left flank. Further, the situation of the German battle-front offered the possibility of enveloping the German right wing. It was therefore unnecessary to continue the retreat to the line previously given, and the moment to take the offensive was close at hand. It was ordered for September 6th, and to take place from a line north-east of Meaux—Chanais—Coulommiers—Courtacon—Esternay—Sézanne—south of the St. Gond marshes—north of Revigny.

The battle engaged on September 6th, which resulted in a victory over the German Armies, thus originated from the plan conceived on August 25th.

V.—After the Battle of the Marne.

The defeated enemy Armies retired and the pursuit was taken up. The Allied forces on the left were to attempt to outflank the German right wing, those in the centre were to concentrate their efforts against the enemy's centre and left, whilst the Third Army was to try to cut the enemy communications by making an energetic offensive northwards between the Argonne and the Meuse, based on the Hauts-de-Meuse and Verdun, and with its right flank refused.

In a short time, however, the pursuit had for various reasons to be stopped. The enemy turned and faced his opponents. The Sixth Army, though reinforced, made efforts to envelop the German right in vain. To meet these efforts, the enemy began a similar operation against the Allied left, and thus the "race to the sea" started. It finished after the battles near Ypres some weeks later. Although the German battlefront had not been turned, the enemy had been prevented from out-flanking the Allied left and from interfering with the British line of communications.

THE OPERATIONS OF FIELD-MARSHAL FRENCH AGAINST THE FIRST ARMY AND THE VIIth RESERVE CORPS IN THE SUMMER OF 1914.

By General von Zwehl
(formerly commanding the VIIth Reserve Corps).

(*Translation from the German.*)

Being part of articles in Nos. 35, 36, 37, and 38 of the *Militär Wochenblatt*, September, 1919.

[*Note by Translator.*—The articles are mainly a criticism of Viscount French's book, "1914," but the author of them gives a good deal of information as to the German movements, and particularly copies of the German Supreme Command (O.H.L.) Instructions to the Armies on August 28th and September 3rd, 1914, which are of great interest. The portion here translated deals with the British retreat.]

THE First German Army, under General Oberst von Kluck, crossed the Belgian frontier on August 13th, and, after the fall of Liège, advanced by very rapid marches through Brussels and south of that capital, so that on August 21st the heads of its columns were on the line Castre-Hal—north of Nivelles, and on August 22nd on the line Ninove—Ollignies—Chaussée Notre Dame Louvignies—Mignault. The First Army, after the detachment of the IIIrd Reserve Corps against Antwerp, had four corps available:—

IInd Corps;	commander,	Von Linsingen.
IVth Corps;	,,	Sixt von Armin.
IIIrd Corps;	,,	Von Luchow.
IXth Corps;	,,	Von Quast.

On the outer right flank was Von der Marwitz's H.C.C. (Higher Cavalry Command), collected together after various wanderings for the protection of the right flank. On August 23rd, from the west of Renaix, his three divisions reconnoitred towards Courtrai—Roubaix—Lille.[1]

On August 21st, the Second Army, advancing on the left of the First in a southern direction towards the Sambre with its right on

[1] Note by Translator.—Men of the 4th and 9th Cavalry Divisions were, however, identified on August 23rd between Mons and Condé.

Nivelles, attacked the French Fifth Army, and in the following days drove it back over the river.

General Oberst von Kluck understood his deployment instructions in the sense that the mission of the First Army was to protect the right flank of the German forces, particularly against the English Expeditionary Force, which was expected to appear in that direction. As regards the arrival of this force the information was unreliable, and as regards its direction of advance there was no news whatever. Even a message from O.H.L. (the Supreme Command), dated August 20th, which arrived at First Army Headquarters on the evening of the 21st, ran:—"Disembarkation of the English at Boulogne and their employment from direction Lille must be reckoned with. The opinion here, however, is that large disembarkations have not yet taken place."

The First Army Commander thought otherwise, and therefore wished to continue his march south-westward, while the Second Army Commander, under whom the First Army was temporarily placed, considered that by so doing he would not be in a position to support the right wing of the Second Army promptly, and therefore desired a more southerly direction. The First Army was also detailed to take in hand the investment of Maubeuge on the north and north-east fronts.

As from Hal to Mons is only twenty-five miles, the uncertainty as regards the enemy is surprising; it was only on August 22nd that an English cavalry squadron was heard of at Casteau, six miles north-east of Mons, and an aeroplane of the 5th English Division, shot down that day, had gone up from Maubeuge. The presence of the English in front was thus established, although nothing as regards their strength. The First Army Commander again endeavoured, but in vain, to obtain approval for his left flank to advance via Mons, Bavai. The Second Army Commander only conceded that the investment of Maubeuge on the north and north-east fronts should be undertaken by the VIIth Corps of his army.[1] The plans of the First Army, to envelop the left flank of the English and drive them or the greater part of them into Maubeuge, were therefore somewhat hampered. Although it is quite comprehensible that the Second Army did not wish to lose the co-operation of the First Army in forcing the strong section of the Sambre west of Liège, in view of the uncertainty of the situation and of the difficulties involved, yet by the line of advance selected the envelopment of the left wing of the English was rendered less easy. Whether Von Kluck would have been successful on the Mons Canal if he had had his own way is little probable, for Field-Marshal French has told us that he early recognized the danger threatening him.

When French learnt on August 22nd that Lanrezac had retired south of the Sambre after an unsuccessful fight, his situation seemed far from good. Lanrezac, as he tells us, proposed to him that he should disembarrass the French Fifth Army by an attack "on the

[1] The attack on Maubeuge was later allotted to the VIIth Reserve Corps.

flank of the German force that was driving Lanrezac from the Sambre." How the French General came by this idea, as if he knew nothing of the approach of the German First Army, is not quite comprehensible.

In any case (we may say unfortunately) French declined to entertain the idea, which would have led him into a regular wasps' nest of the First Army, and commenced his retirement in a southerly direction on August 24th. French tells us that he played with the idea of throwing his two corps in Maubeuge and getting invested there, but rejected it on thinking of Bazaine's fate in Metz.

The First Army was, however, so near to French that there was some rearguard fighting on and south of the canal, particularly at Mons. These only slightly delayed the English retirement, but cost the Germans some losses. French reached a position previously selected east of Valenciennes (at Jenly), near Maubeuge, practically undisturbed, whilst the First Army crossed the Mons—Condé Canal, took possession of Condé—worthless as a fortress—and got to the line Onaing—Givry. The combatants were thus still ten to twelve miles apart.

French rightly judged that it was important to General Oberst von Kluck to envelop the English left flank. It did not escape him that another corps—the IVth Reserve Corps (General von Gronau)—was following close up behind the First Army. His orders for the 25th, therefore, were for a retirement to the Le Cateau position—that is, a line on both sides of that place and eastwards to Landrécies.[1] There was all the more reason for this withdrawal, as he had information of the continued retreat of the French Fifth Army, operating on his right (east), as well as of the Fourth and Third Armies, further south-east. As a result of the lively pressure of the German First Army there were fights at Solesmes and Landrécies, in which the English resistance was successfully broken.[2] The intentions of the First Army Commander for August 26th were not altered; they were the envelopment of the English left (west) flank. Simultaneously the English right wing was to be enveloped by the IIIrd Corps, but the blow was parried by the English Ist Corps.[3]

The English IInd Corps on the line Le Cateau—Crèvecoeur[4] was sharply attacked by the IVth Corps and IVth Reserve Corps, and

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1 Note by Translator.—Catillon must be meant.

2 Note by Translator.—At Solesmes the Germans pushed forward only small bodies of infantry, and the rearguard of the 7th Infantry Brigade withdrew when its task was complete.

3 Note by Translator.—This is a curious statement; part of the German IIIrd Corps endeavoured to envelop the right wing of the British *IInd* Corps, not of the Ist Corps, between which and the IInd Corps there was a gap of several miles. On the 26th the Ist Corps, followed by the German Xth Corps, retired southward unmolested except for a trifling rearguard affair at Favril and a more serious one near Le Grand Fayt, in which the Connaught Rangers lost about 300 officers and men.

4 Note by Translator.—Actually the line did not extend beyond Esnes, three miles short of Crèvecoeur.

only escaped envelopment with difficulty and by the assistance of two French territorial divisions which supported its left flank.[1]

The English retreated in the direction of St. Quentin, behind the Somme and then behind the Oise, to the line Noyon—La Fère, which was reached on August 30th.

From August 28th onwards, French, apart from small collisions between his rearguards and the cavalry, succeeded in shaking clear of the enemy. The losses were considerable. The English Field-Marshal puts them at over 15,000 officers and men and eighty guns. The total is probably too great, and must include men temporarily missing. On the main day of battle, August 26th, the First Army only made 2,600 prisoners.[2]

On August 28th the heads of the columns of the First Army reached the Somme; right flank east of Albert, the centre at Peronne—St. Crist, the left wing of the IXth Corps somewhat held back six miles north-west of St. Quentin at Pontinet. The First Army Commander considered that it was more important to reach the flank of the retreating main French Army, by moving in a south-easterly direction, than to press the English away from the coast, and advocated to the Second Army that his army should advance on Compiègne—Noyon, and the Second Army on Quierzy—Chauny. This would certainly also bring the First Army on to the English front, if French accepted battle. On August 28th, however, the general instructions of O.H.L. for further operations were received. These were definite:—

> "The First Army with H.C.C. 2 (Von der Marwitz) will march west of the Oise towards the lower Seine. It will be prepared to co-operate in the actions of the Second Army. It will deal with any new formations of the enemy in its area. The Second Army, with the attached H.C.C. 1 (Von Richthofen), will advance over the line La Fère—Laon on Paris. It will undertake the investment and capture of Maubeuge, and later of La Fère, and, in conjunction with the Third Army, of Laon. All armies must arrange for mutual co-operation and render support to each other should fighting take place in another's section. Should the enemy offer determined resistance, as he may, on the Aisne, and later on the Marne, it may be necessary to change the direction of the armies from south-west to south."

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[1] Translator's Note.—It has already been pointed out that the IIIrd Corps attacked the right flank of the IInd Corps: General von Zwehl entirely omits mention of Von der Marwitz's strong cavalry force—three cavalry divisions, including at least six Jäger battalions, which was identified on the field. The French territorial divisions left Cambrai for Arras and Bapaume early in the morning (*Journal d'un Officer de Cavalerie*, p. 30). Possibly the Germans saw something of General Sordet's cavalry corps late in the day, but it was never seriously in action. The battle appears to have been between the British 3rd, 4th, and 5th Divisions and three German corps supported by a strong cavalry force.

[2] Translator's Note.—This, no doubt, as usual, includes wounded and possibly dead. The actual number of guns and howitzers lost was 36, and officers and men under 8,000 (see Major Becke's "Royal Regiment of Artillery at Le Cateau"). In the second edition of "1914," Lord French has corrected the figures which he originally gave.

In accordance with this instruction, General Oberst von Kluck continued his advance on August 29th in a south-west direction, and on August 30th reached Villers Bretonneux—Moreuil—Roye, with half the IXth Corps at Guiscard. In the following days he moved the First Army: its right wing via Amiens—Clermont—Creil—Senlis to the district north of Meaux, where it was retained to protect the right flank against any forces issuing from Paris; its centre (only the principal roads are named) via Peronne—Roye—Compiègne—Crepy-en-Valois—La Ferté sous Jouarre on Coulommiers; and its left wing via St. Quentin—Chauny—Soissons—Château Thierry on Esternay. These destinations were reached on September 5th. On the east the Second Army moved southwards; the VIIth Corps, which was on its right, via St. Quentin (where it came into collision with the French)[1]—La Fere—Soissons—Château Thierry on Montmirail. On September 5th the Second Army was a short day's march behind the left wing of the First Army. From August 30th onwards the march of the First Army had been tied (*gebunden*) by the following "directive" of O.H.L.:—

> "Intention of O.H.L. is to drive the French in a south-east direction away from Paris. First Army will follow echeloned behind the Second Army, and is henceforward responsible for the flank protection of the forces."

The First Army thus had a double task; first it was to be echeloned in rear to take over the flank protection of the forces, which meant remaining behind the Second Army; and secondly, in addition, it had to take part in the whole sense of the order in driving the enemy in a south-easterly direction.

The tasks were, therefore, somewhat contradictory. The Commander of the First Army made flank protection the secondary one; he considered it sufficiently secured by one corps (IVth Reserve) and one cavalry division (4th) north of Meaux, and one corps (IInd) west of Coulommiers; he desired to take part in the drive against the French with three corps IVth, IIIrd, IXth) and the H.C.C.2 (two cavalry divisions). This seemed the more indicated and, in the sense of a really strong attack movement, as the latest information from the Second Army stated that it had *decisively defeated* the enemy; however, it had not followed up the success rapidly, although the French had apparently streamed backward in disorder. The First Army could, therefore, still hope to reach them and drive them away from Paris.

Under cover of numerous small rearguard actions, which, however, led to no important decision, the English had retired by September 5th to the line Mortcerf—Rozoy—Gastins, fronting east, and Field-Marshal French had his headquarters in Melun. On the right flank of the English, forming a right angle with their front eastwards towards Sezanne, was the French Fifth Army. Northwards from the English left flank, resting on Montry and Meaux, the French Sixth Army, under General Maunoury, was assembling.

[1] Translator's Note.—Guise is no doubt meant.

The English Army had had no easy time of it in its retirement from August 22nd onwards. Anyone who has taken part in a forced retreat, if only for a short distance and with little interference from the enemy, knows what a deep impression it makes on the troops, and all—even the best—leaders.

The English Army in the autumn of 1914 was a professional army of selected men, all muscular fellows for the most part accustomed to hard service. The retreat, according to French, had affected even them badly. French was upset most because he had lost his communications with Calais, Boulogne, and Havre, and had to create a new base at St. Nazaire—Nantes. The retreat had had a particularly depressing effect on the General commanding the left (west) English wing, Sir Horace Smith-Dorrien, with his IInd Corps. French states that the General had declared that there was nothing left except to retire on the English base, to reconstruct the army completely, to re-embark it and to attempt to land it at some favourable place on the coast. Very thoroughgoing advice which French would not listen to as it appeared to savour of despair. Perhaps Smith-Dorrien was thinking of the course of action which the English General, Sir John Moore, was driven to when Soult was on his heels in Spain in January, 1809, and the English only reached their ships at Corunna with great loss, and their leader himself found his death. It was not as bad as that. Smith-Dorrien appears to find these and other criticisms of French unjustified, for he has desired to defend himself against them, but this has not been permitted. At the end of August French declared to General Joffre that for the moment it was impossible to employ the English troops as part of the fighting line.

It is clear from all this that the German success on the right flank of the German Armies would have been greater if there had been sufficient forces to form a really strong flank guard on the Paris side, and further to continue the attack towards the Seine with numerous and efficient fresh troops, or at least to keep off the counter-attacks commenced on September 6th by the French and English.

Whether this last at least was possible, opinions differ. Even Ludendorff says, in his memoirs, that he could not ascertain it with any certainty.

When Namur was taken on August 23rd, two corps (XIth and Guard Reserve) were there and not available for the decision on the German eastern flank. Considerable forces were transferred to the eastern theatre.[1] They did not participate in the victory of Tannenberg. They arrived too late for it.

The pursuit by the First Army was and had to be carried out under conditions of the greatest strain with very long marches, and with many small fights that absorbed much time. The fighting strength of the units was much reduced. Old Yorck, after the battle of the Katzbach in 1813, conducted the pursuit of the enemy too slackly in the eyes of the fire-eater Gneisenau, and, for this and other differences of opinion, drew on himself his lasting enmity. What numberless

[1] Note by Translator.—The XIth and Guard Reserve Corps, in fact.

unenergetic pursuits are blamed in military history! Perhaps here was the case that Yorck thought of a hundred years ago: that pursuit should not expose the victor to being severely exhausted, if he has to reckon with the appearance of new enemies from behind the scenes. In any case the First Army did not fail in energy.

Field-Marshal French, at least in his "Recollections," takes the opposite view. After accusing his opponent of underestimating the enemy, etc., he gives it as his opinion that the Germans got into a dangerous position through their own carelessness. He assures us that after thorough examination of the situation and of the ground, he has formed the judgment that General Oberst von Kluck exhibited great indecision and lack of energy. . . . . If the English commander will study the marches and fights, compasses in hand, he will at once recognize that the reproach of want of energy is unjustified, even if he takes as his standard the great demands made on troops usual in the German Army in the four-and-a-half-year war, in all theatres of war. As regards the assertion that the leading of the First Army was undecided, perhaps the English Commander-in-Chief, after he has taken cognisance of the orders already quoted, will admit that his opinion was unfounded and unjustified. The contrary was indeed the case; the commander of the First Army always stuck with the greatest persistence to the idea of enveloping the English flank. Sir H. Smith-Dorrien had opportunity of realizing this. In the period September 3rd to 5th the idea of enveloping the main French Army was placed in the foreground with perhaps exaggerated boldness.

THE CAMPAIGN OF THE SECOND GERMAN ARMY, AUGUST-SEPTEMBER, 1914.

"Mein Bericht zur Marne Schlacht."

GENERAL FELDMARSCHALL VON BÜLOW, August Scherl, Berlin, 1919.

SINCE the publication of General Baumgarten-Crusius' book, "Die Marneschlacht, 1914," which brought so many controversial points in its train, further enlightenment on the German operations during the period of open warfare in August and September, 1914, has been awaited with increasing interest. It is therefore with no little satisfaction that we are now able to read the report of General von Bülow, the senior Commander of the three right wing Armies, on the period in question, and set at rest various speculations as to the causes of the German reverse on the Marne.

General Crusius has told us that at the outbreak of war Bülow was the general favourite for the post of Chief of the Staff at Supreme Command, but that the Emperor at the last moment selected Moltke for this all-important position; and probably, as General Crusius adds, rather for his name than for his military capabilities. It was perhaps a fortunate choice from our point of view, since from the evidence now at our disposal Bülow stands out as the one Commander whose knowledge of military strategy and personal energy might have lead the German Armies to victory. In spite of the dry nature of his report, it has therefore a somewhat tragic interest, as one watches the vain efforts of a keen commander to make good the lack of control displayed by the Supreme Command.

The opening pages of the report, describing the capture of Liège, are in themselves a sufficient testimony to the gallant defence of that fortress by its Belgian garrison. So early as August 7th, Bülow left Hanover to take up his command in the belief that Liège had fallen, and that the way was clear for the advance of his Army. Again, on the 10th, he quotes a Supreme Command order directing "units which have been employed at Liège belonging to other Armies to return as soon as possible to their own commands," and ordering the Second Army "to move forward to Liège." It was not, however, till the 17th that this order could be carried out, and the roads finally opened for the advance of the First and Second Armies into Belgium.

The account given of the Battle Charleroi—Mons is very brief and rather unsatisfactory. Supreme Command Order of August 20th directed that the attack against the enemy forces west of Namur was to be carried out in co-operation with the offensive of the Third Army against the Meuse line, Namur—Givet, leaving the manner of its execution to the

two headquarters to arrange between themselves. It also informed him that at least three French Corps were between Namur and Givet, and that more enemy columns were advancing northwards between Namur and Maubeuge. (Of the British, he was informed that no considerable force was believed to have been landed yet—a satire on the German Intelligence Service, considering that two-thirds of the British Army were at that moment within thirty miles of Bülow). The great strategic advantage held by the German Second and Third Armies over the enemy's forces in the triangle between the Meuse and the Sambre is obvious, offering as it did an opportunity to attack them simultaneously in front, flank and rear. A combined offensive of the two Armies to this end was therefore arranged for the 23rd. On the morning of the 22nd, however, Bülow came to the conclusion that besides three Cavalry Divisions there was only a weak force of French Infantry south of the Sambre. He therefore decided to cross the Sambre immediately and ordered the attack to begin. By this action he showed his strength to General Lanrezac, commanding the French Fifth Army, who promptly ordered a hasty withdrawal, and by the 23rd was already in full retreat from a perilous situation before the Third Army was ready to make its offensive. General Crusius fills in this gap in Bülow's report for us, and describes the belated efforts of a strong force detached from the Third Army to cross the Meuse by Givet and get to Rocroi astride the French line of retreat, only to find all the roads leading south already filled with the retreating columns, against whose flank guards no headway could be made. To Bülow's premature attack must be laid the blame for thus losing a great opportunity, never to recur, of forcing the French Fifth Army, as also the British Army, ignorant though he was of its presence, westwards and completely separating both from the main French battle-line. Instead, the French Fifth Army was now able to get away southwards and fill up again the gap between it and the French Fourth Army, at the same time enabling the withdrawal of the British Army on Paris.

The first few days of the pursuit through Northern France passed off uneventfully for Bülow; the First and Third Armies wheel round into line with him and the great drive, for at this stage it is little else, begins. Bülow mentions no ulterior German plan, and we have to rely on the authority of General Crusius that the intention of the Supreme Command was to wheel the five German Armies, pivoting on Thionville, through northern and central France, forcing the whole of the enemy's forces back against the Swiss frontier. An operation of such a nature demanded extremely careful handling by the Supreme Command, including detailed instructions for the frontage of each Army, to keep the alignment and prevent overlapping. Instructions of such a kind were, however, conspicuously absent. On August 26th we find Bülow lamenting in vain to the Supreme Command that the Third Army was not conforming to the south-westerly wheel of the Second Army, and that there was already an unpleasant gap between the two. On the 27th the First Army (which since August 20th had been under Bülow's orders) was, he says, "suddenly removed from the control of the Second Army by order of

the Supreme Command, thereby making the co-operation of the three right-wing Armies still more difficult."

On the 28th the situation gets worse. The First Army Commander, whose efforts to free himself from any immediate control are now crowned with success, takes the bit in his teeth and reports to Bülow that he intends to pursue and surround (*einkreisen*) the British Army, his left advancing on Nesle. On the same day the Third Army sent a wireless to Bülow to the effect that the right wing of the Fourth Army was in difficulties south of Sedan and demanded assistance and that the Third Army was therefore about to wheel south-eastwards accordingly. Bülow, who had now no control over any Army but his own, writes with dismay, "my Army was thus threatened with isolation."

On the morning of the 29th to add to his distress his right, advancing on Essigny le Grand, is attacked, and the account of his personal movements on receipt of this news forms a refreshing oasis to the weary reader after travelling through a desert of forty pages of orders, messages and instructions. "I intended," he writes, "to go to Essigny le Grand that morning from my headquarters at Etreux, but on approaching Homblières heavy artillery fire was audible from the south-west. I therefore went on to some high ground north-east of the village to see what was going on" (which reads like the act of a general of the bow and arrow period). "Although the situation was by no means clear, it was obvious that the Xth Reserve Corps was being attacked by fairly strong forces from the south-east and also that heavy fighting was in progress east of the Oise. To the south-east could be seen a weak enemy firing-line advancing towards Marcy. I therefore immediately put in two companies, which had just come up, to meet it and thus brought this preliminary operation of the enemy to a standstill." In spite of this little victory entirely of his own in a remote corner of the battlefield, he is soon afterwards full of concern as to the situation of his Army and takes steps to improve it. A wireless message is sent to the Third Army to march on Vervins to take part in the fighting of the Second Army; similarly a wireless is sent to the First Army to come to his support. It seemed, in fact, to be an accepted formula of all the Army Commanders to wireless in all directions for help as soon as the enemy made any show of resistance.

The battle of Guise—St. Quentin which followed was, however, fought out without any assistance from the Third and only the slightest from the First Army. Von Bülow's cries for help, however, had a far greater effect than he ever intended and, in fact, altered the whole course of the campaign—even perhaps saved Paris. Kluck, having failed to surround the British Army on the 29th, gave up the chase as hopeless and was eager for a new prey; Bülow's cry put a fresh idea into his head and, leaving the embryo of the French Sixth Army lurking south of the Somme and the British Army to go where it listed, he decided to wheel inwards and attack the left flank and rear of the French force in front of Bülow. Writing of this movement Bülow says, "In any case it was only intended as a temporary tactical support and by no means as an attempt to abandon the plans laid down in the latest Supreme Command

Order for the progress of the campaign." To his consternation, however, the Supreme Command take Kluck's will o' the wisp strategy seriously, and the order referred to of the 28th, directing the First Army west of the Oise to the Lower Seine and the Second Army on Paris, is indeed abandoned, and by a new order of the 30th the advance is to be continued due south instead of south-west, with the left of the Second Army on Rheims. Bülow continues: "Apparently the Supreme Command were still ignorant of the fact that detrainments of strong enemy forces had taken place at Amiens, Roye, Mareuil, and Montdidier." With that he leaves the subject and busies himself with the capture of La Fère and Laon.

Although the report is pleasantly free of any malice or bitterness against either superior authority or subordinates, it is clear that he already regarded the careless attitude taken up by the Supreme Command, especially with regard to the wayward obstinacy of the First Army Commander, as a hopeless one and that he fears the cumbersome engine of war ploughing its way through France without a driver has difficulties ahead of it.

By September 3rd, however, he is more cheerful again and when he hears that the enemy has given up the northern bank of the Marne without a fight he writes: "The enemy's retreat is gradually turning into a rout." The First Army is still a source of worry. Kluck had shown not the slightest intention to carry out the Supreme Command Order of September 3rd to the effect that the First Army was "to follow in echelon behind the Second Army and protect the right flank of the Armies." Instead of this the First Army had, he says, "become echeloned in front of the Second Army"; to make matters worse Kluck, the bit still firmly in his teeth, reported to the Second Army that he was of the opinion that, "contrary to Supreme Command Orders, the pursuit should be continued as far as the Seine immediately," and has accordingly ordered for the 5th "all the Corps of the First Army to make a further advance and attack the enemy wherever met." Bülow's only comment on this is that "the strategic situation of the German right wing Armies had thus become very unsatisfactory and the Supreme Command pay no attention to it."

On September 5th, although Kluck's leading corps were already across the Marne overlapping in front of the right of the Second Army, an order arrived from the Supreme Command for the First Army to turn and face Paris between the Oise and the Marne and for the Second Army to do likewise between the Marne and the Seine. For the Second Army the accomplishment of this order was simple and on the 6th it began to form round to the right to a line Mont Mo'rail—Marigny le Grand facing Paris. For the First Army, which was already well on its way to the Seine, it meant a most difficult manœuvre, which was further complicated by the sudden appearance of the French Sixth Army with offensive intentions against its right flank and rear.

The battle of the Ourcq that followed was not in Bülow's province, but he watches with much dismay the removal one after another of the corps of the First Army to the Ourcq battlefield, leaving his own right

flank completely open to attack. When Kluck asks that the IIIrd and IXth Corps of the First Army, over which he had asked Bülow to take temporary command 24 hours previously, might also be sent to the Ourcq, Bülow protests and gives in his report a very reasonable solution of the riddle of the Ourcq. "If," he writes, "the First Army was actually opposed by such strong forces west of the Ourcq that the IInd, IVth and IVth Reserve Corps could not effectively deal with them alone, and the support of the IIIrd and IXth Corps was urgently needed, it would perhaps have been better to break off the fight west of the Ourcq with those three Corps and regain touch with the Second Army—about Chateau Thierry. Although the First Army would have had to renounce the possibility of a tactical victory, it would have fulfilled its principal duty of protecting the flank of the Armies and, by withdrawing the IIIrd and IXth Corps behind the Dollan during the night of the 7th-8th, the enemy would have again found a united German front opposed to it on the morning of the 8th which it could have neither broken through nor outflanked." Kluck, however, was of an obstinate disposition and it needed the presence of Colonel Hentsch with full powers from the Supreme Command two days later to make him let go his adversary and break off from the battle.

The damage, however, was by that time already done and a gap of 30 miles lay between the First and Second Armies into which the British Army and right of the French Fifth Army were rapidly moving. Bülow takes full responsibility for the withdrawal of the whole German battle-line behind the Aisne as a result of this situation. The idea found favour with Colonel Hentsch, who had come from the Supreme Command, and the latter used his prerogative to order the Armies back. "By this decision," Bülow writes, "the outflanking of the German right wing by forcing away and defeating the First Army in detail was prevented at the critical moment and it was then possible to form a new and united front a few days later on the Aisne with the help of the Seventh Army."

Supreme Command on the 10th came to the conclusion that Kluck could no longer be trusted to act on his own initiative and during the afternoon ordered the First Army to come under the control of the Commander of the Second Army until further orders.

It is clear that in the opinion of the Supreme Command Bülow came out of the ordeal of the Marne with an unsullied reputation. During the efforts of the French Generalissimo to outflank the German right in the following weeks, his advice is constantly sought by the Supreme Command and when he suggests that he himself should command a new Army group extending the German front to the north-west, it is granted. On October 9th he takes leave of his Army on the Aisne and goes off to command a new Second Army between the Oise and the Somme. In February he was promoted Feld Marschall.

The book is accompanied by seven clear sketch maps with which the whole operations described can be followed. Special sketch maps showing the situation on September 9th, when the decision to withdraw behind the Aisne was made and another tracing the advance of each Corps from the French frontier to the Marne, are also of interest.

THE FRENCH 84th TERRITORIAL DIVISION AT MONS AND LE CATEAU, 23-26th AUGUST, 1914.

THE following extracts from an article in the French journal "La Renaissance," of 25th November, 1916, quoted by Colonel Bujac in his book "La Belgique Envahie" (Fournier, Paris, 1919), gives an interesting account of the activities of the French 84th Territorial Division, which have generally been overlooked, on the immediate left of the British Army during the period 23rd-26th August, 1914.

On the 22nd August, 1914, this Division, which was the right wing of the group of reserve and territorial divisions under General d'Amade, cleared the front of the British Expeditionary Force and, on the 23rd, formed on its left. Its front extended from Condé north-westwards along the Scheldt (here accompanied by a canal) to Maulde, eight miles to the north-west of Condé. The division, like the extreme left of the British Force, was not engaged on the 23rd August, the first day of Mons. It commenced retiring on the 24th, and gradually withdrew to Valenciennes, and then to Cambrai, which it defended on the 26th August, during the battle of Le Cateau, against the advance of the German II. Corps.

The extracts given by Colonel Bujac are as follows:—

"The 84th Territorial Division, under General de Ferron, came from the IV. District, and consisted of the 167th Brigade (General Roederer) and the 168th Brigade (Colonel d'Harcourt), and comprised the 25th, 26th, 27th, and 28th Regiments.

"At 4 a.m. on the 24th August the Germans attempted, and failed, to enter Saint Amand (7 miles west of Condé), as Montagne and L'Ecluse (in front) were held by detachments of the 26th and 27th Territorial Regiments and of the Depôt of the 127th Regiment. A squadron of the 14th Hussars, posted west of the fort of Maulde, became engaged with a detachment of Uhlans at 2 p.m. and retired about 5 p.m. The infantry did not leave Saint Amand till 10 p.m. (24th) and then withdrew towards Raismes (3 miles north-west of Valenciennes).

"The Germans were reported at Denain (6 miles south-west of Valenciennes), but did not enter Valenciennes till the 25th.

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"The 2nd Battalion of the 27th Territorial Regiment was in position about Condé. 5th Company at Hergnies, 6th Company at Condé, and 7th Company at Vieux Condé (3½ miles north-west of Condé), and 8th Company at Chateau l'Abbaye (6 miles north-west of Condé).

"The two battalions of the 26th Territorial Regiment, in position at Fresnes (2 miles south of Condé), were attacked on the Vicq-Crespin

road, and badly shaken, during the morning of the 24th: they retired on Valenciennes, which they left during the night of the 24th-25th for Cambrai. On their way there, when nearing Haspres (8 miles south-west of Valenciennes), they were attacked again and became disorganized.

"Fighting about Bassin—Rond took place on the 25th August; and the attack on the 26th August at Pallencourt was met by the 28th Territorial Regiment (both places about 6½ miles north of Cambrai).

* * * *

"On the 25th August at 4 p.m. the 25th Territorial Regiment had its 1st Battalion at Ramillies (2 miles north of Cambrai); the 1st Battalion of the 27th Territorial Regiment was at Tilloy (west of Ramillies).

"The defence of Cambrai was organized along its north-eastern front from the Pont d'Aires to Tilloy (both about 1½ miles north of Cambrai). The outposts of the 27th Territorial Regiment were withdrawn behind the canal during the evening of the 25th. The attack developed on the morning of the 26th at Escadoeuvres (1½ miles north-east of Cambrai) on the Solesmes road. The Battalion of the 27th fell back on to the "Pont Rouge" and the railway; the 25th Territorial Regiment took up a position by the canal bridge. The final resistance was offered in the suburb of Saint Olle, which the staff of the 84th Territorial Division left at 12.30 p.m. Captain Saglier, of the 27th Regiment, defended the barricade near the church till about 2.15 p.m. The General commanding the 167th Brigade was captured in his office."

NAVAL NOTES.

GREAT BRITAIN.

The notes in this issue of the JOURNAL cover the first quarter of 1920, during which period there were a number of events of importance connected with the Royal Navy. The Atlantic Fleet made a cruise to the Mediterranean, which was extended by unforeseen events to Constantinople and the Black Sea. The patrol, minesweeping, training, and fishery protection squadrons were organized on a peace basis. About a dozen more naval bases and establishments were closed down, and appointments in connection with them abolished. The battle-cruiser "Renown" left England with the Prince of Wales on his Australian tour; and the "New Zealand" returned with Admiral of the Fleet Lord Jellicoe. An exceptionally large number of new appointments, including eleven officers of flag rank, and four new members of the Admiralty Board, were officially announced during the quarter; and the Navy Estimates for the coming financial year were also issued and discussed in Parliament.

THE BOARD OF ADMIRALTY.

By Letters Patent under the Great Seal, bearing date March 15th, the King appointed a new Board of Admiralty, in which Rear-Admiral the Hon. Algernon Boyle, who flew his flag last year in the "Carysfort" in the Baltic, was appointed Fourth Sea Lord, in succession to Captain Sir Alfred Chatfield; and the latter became Assistant Chief of the Naval Staff in succession to Rear-Admiral J. A. Fergusson. On leaving the Board, Rear-Admiral Fergusson was awarded the K.C.M.G., and was appointed to the "President" for special service with effect from March 15th.

On March 18th, the Admiralty announced that Rear-Admiral Frederick L. Field had been appointed Third Sea Lord and Controller of the Navy in succession to Rear-Admiral Sir William C. M. Nicholson. Rear-Admiral Field had formerly for two years held the office of Director of Torpedoes and Mining, in which he was succeeded by Captain A. K. Waistell, from the "Vernon."

Speaking at the annual dinner of the Institute of Metals on March 12th, Rear-Admiral Sir William Nicholson, the retiring Controller, said that the Navy had not ignored the scientists; it had taken them greatly into its confidence. In wireless, we led the world owing to its use in the Navy. Marconi had told him before the war that he had been in every country, and there was no body that had studied or perfected the organization of wireless like the British Navy had. Sir William said that he would crave sympathy on behalf of the Navy for the enormous task in front of it. He could not believe that an Agapemone of love had now come upon the world. Either we had to maintain our command of the sea or lose it.

On March 20th, the appointment was officially announced of Dr. Macnamara to be Minister of Labour in succession to Sir Robert Horne. Dr. Macnamara had been for twelve years Parliamentary and Financial Secretary of the Admiralty, having been appointed in April, 1908, when Mr. Asquith became Prime Minister. Speaking in the House of Commons on March 17th, Mr. Long, First Lord, bore testimony to the splendid loyalty and generous goodwill with which Dr. Macnamara had aided him, and spoke of the retiring Secretary having been engaged daily

in fighting the Treasury on behalf of the men of the lower deck, so much so that the Treasury had a holy horror of seeing him on their doorsteps, as they knew what the result was going to be. On April 3rd, the appointment of Sir James Craig, Bart., to succeed Dr. Macnamara at the Admiralty was published.

In a speech at the 137th anniversary festival banquet of the Highland Society on March 22nd, Admiral of the Fleet Lord Beatty, referring to the Memorandum on Naval Policy, which had been issued with the Navy Estimates, said: "We are called the Silent Service. Last week we broke the silence. We took the Empire into our confidence, and. . . . . the British Empire and the world at large were told of the problems we are thinking about. Many of them, no doubt, are controversial. I hope that the Memorandum will produce criticism. We are not afraid of criticism. I would ask that the criticism shall be fair; that it shall be constructive and not destructive. We are trying to meet the problems in a spirit of advancement coupled with economy. But the economical side, which is most important, and which we have not lost sight of, is one which requires a note of warning. You cannot have a really valuable thing without paying for it. We came into being by the sea, we exist by the sea, and the day that we forget it, and forget sea power and all it means, the British Empire will crumble to the ground."

Naval Commands and Appointments.

The principal change in command announced to take place was that of Commander-in-Chief at Portsmouth. On March 31st, it was announced that Admiral the Hon. Sir Somerset A. Gough-Calthorpe would assume this post on April 28th in succession to Admiral Sir Cecil Burney. At noon on April 11th the flag of Admiral Burney was struck in the "Victory" on his going on leave preparatory to handing over the command. In a farewell message, Sir Cecil Burney expressed his regret that he had been compelled to resign the Portsmouth Command for health reasons.

In the Atlantic Fleet, three new flag appointments were made. Rear-Admiral Henry M. Doughty was selected to be Rear-Admiral in the First Battle Squadron in succession to Rear-Admiral the Hon. Victor Stanley; and Rear-Admiral Edward B. Kiddle to be Rear-Admiral in the Second Battle Squadron in succession to Rear-Admiral Lewis Clinton-Baker. These changes were to date March 24th and April 1st respectively. Rear-Admiral Michael H. Hodges, Chief of Staff to the Commander-in-Chief, was nominated to succeed Commodore Hugh J. Tweedie in command of the destroyer flotillas of the Fleet, on May 1st. Captain C. T. M. Fuller became Chief of Staff to Admiral Madden in his place, with the rank of Commodore, 1st Class.

Changes in the command of all five divisions of the Reserve Fleet at the ports were announced. As Rear-Admiral in the Reserve Fleet at the Nore, Rear-Admiral Vivian H. G. Bernard was on March 4th appointed to succeed Rear-Admiral H. L. Mawbey, to date March 17th. On the former taking up this post, the battleship "Erin" became flagship of the Rear-Admiral instead of the battle-cruiser "Inflexible," which was ordered to be paid off.

On March 5th, the appointment was announced of Captain James R. P. Hawksley to succeed Vice-Admiral Sir Douglas Nicholson as Captain-in-Charge at Portland, to date April 1st; and subsequently, Captain Robert A. Hornell, formerly Flag-Captain to Admiral Nicholson, was appointed Senior Officer of the Reserve Fleet at Portland as from the same date. Captain Hawksley was to be responsible to the Commander-in-Chief at Portsmouth for the administration of the dockyard and naval establishments; and Captain Hornell to the Vice-Admiral Commanding the Reserve Fleet for the administration of ships of

that fleet at Portland, but he will not have charge of vessels in reserve attached to H.M.S. "Vulcan" and H.M.S. "Gibraltar," which are under the administrative control of the Rear-Admiral (S) and the Commanding Officer of the "Gibraltar" respectively. The ledger of Portland Naval Depôt is now known as H.M.S. "Victory XI.," the "Research" having been paid off.

On March 10th Rear-Admiral Philip H. Colomb was appointed Rear-Admiral in the Reserve Fleet at Devonport, in succession to Rear-Admiral Maurice Woollcombe, to date April 9th. A fortnight later, Rear-Admiral Clement Greatorex was appointed Rear-Admiral in the Reserve Fleet at Portsmouth in succession to Rear-Admiral Cole C. Fowler, with effect from April 23rd. Lastly, Rear-Admiral Crawford Maclachlan was appointed Rear-Admiral in the Reserve Fleet at Rosyth, in succession to Rear-Admiral Charles F. Corbett, to date May 1st.

Replying on March 31st to a question, by Viscount Curzon, Sir Robert Sanders stated in the House of Commons that the ships, large and small, for which the flag officers of the Reserve Fleets were responsible were:—Chatham-Sheerness, 25; Portsmouth, 28; Devonport, 26; Rosyth, 9 (all large ships); and Portland, 3 (all large ships). The minimum complements of the ships vary from 10 per cent. of full complements in large ships to nearly 20 per cent. in the smaller ships. In addition to these ships, the flag officers in question are responsible for the administration of a large number of ships which are paid off out of the Service, but need a considerable personnel to look after them until they have been disposed of by sale or otherwise. These ships are distributed between Chatham, Sheerness, Portsmouth, and Devonport. For the most part none of the ships of the Reserve have as yet been to sea for practice since they joined the Reserve.

Two dockyard changes were also announced, and a third was foreshadowed by the report on February 19th that Rear-Admiral Sir William Goodenough had been selected for the appointment of Commander-in-Chief on the Africa Station, where Rear-Admiral the Hon. E. S. Fitzherbert will complete two years on June 12th. This will cause a vacancy in the post of Admiral-Superintendent at Chatham Dockyard. On March 2nd, the selection was announced of Rear-Admiral Sir Edwyn Alexander-Sinclair to be Admiral Superintendent at Portsmouth, in succession to Vice-Admiral Sir Charles Vaughan-Lee, to date April 8th. On March 4th, Rear-Admiral Sir John Green was appointed to be Admiral-Superintendent at Rosyth, in succession to Rear-Admiral Sir Henry Bruce, with effect from April 1st. In addition to these dockyards under flag officers, changes also occurred in two of those administered by captains. On February 17th, Captain D. M. Anderson became Captain-Superintendent at Pembroke, in succession to Captain J. G. Armstrong; and on April 1st, Captain W. Bowden-Smith became Commodore-in-Charge at Hong Kong, in succession to Commodore V. G. Gurner.

The position of President of the R.N. War College has been revived during the past quarter. On February 26th, it was announced that Rear-Admiral Herbert W. Richmond had been selected for this post. His promotion to flag rank, with effect from January 29th, had been published a few days previously. Among the officers appointed for duty at the War College, which was resumed at Greenwich instead of at Portsmouth, were Captain Guy Hamilton and Commanders H. J. B. Hall, S. B. Mainguy, and K. A. F. Guy. On March 13th, however, the Admiralty announced that, as the title of "President of the War College" had been the cause of some confusion owing to its similarity to that of "President of the Royal Naval College," the officer conducting the Senior Officers' War Course would in future be designated "Rear-Admiral in Charge, Senior Officers' Course," with the short title, "R.A.S.O.C."

On February 18th, the Admiralty notified that the title of Commodore Commanding the Ægean Squadron had lapsed, and that Commodore M. S. Fitzmaurice, C.M.G., had assumed the title of Commodore, Smyrna, as from February 1st. The islands of Lemnos, Imbros, and Tenedos are under the government of the General Officer Commanding, Royal Marine Force, who is also Military Governor. The functions of the Senior Naval Officer, Mudros, were carried out by the Commanding Officer of H.M.S. "Coreopsis" until February 14th, on which date they lapsed. The trawler "John Bowler" was commissioned on February 12th as nominal parent ship for Mudros.

At the end of March it was announced that Mr. G. H. Ashdown, K.B.E., I.S.O., Director of Stores, would retire on May 31st, after a career extending over 48 years. Mr. J. W. L. Oliver, C.B.E., formerly Senior Deputy-Director, was appointed to succeed him.

Vice-Admiral of the United Kingdom.

By Letters Patent under the Great Seal, bearing date February 2nd, the King was pleased to grant to Admiral Sir Francis C. B. Bridgeman, G.C.B., G.C.V.O., the office or place of Vice-Admiral of the United Kingdom and Lieutenant of the Admiralty thereof, void by the resignation of Admiral Sir Michael Culme-Seymour, Bart., G.C.B., G.C.V.O. Sir Michael Culme-Seymour had held this ancient office since 1901, being appointed by King Edward soon after the latter's accession to the throne. The office had been dormant since 1885 until that time. A short history of the post was published in *The Times* on February 16th, the writer of which said that if during the late war the Germans had succeeded in dropping a bomb into a meeting of the Board of Admiralty and putting all My Lords Commissioners out of action at once, the Vice-Admiral of the United Kingdom would have come into his own, and would have been called upon to discharge the functions of Admiralty pending the appointment of a new Board.

Peace Reductions.

On February 15th, the naval base at Scapa was reduced to a peace status, and Vice-Admiral R. J. Prendergast hauled down his flag as Vice-Admiral Commanding the Orkneys and Shetlands. The records of the Lerwick and Scapa bases were transferred to the Commanding Officer of the North of Scotland Area, Captain Alan C. Bruce, C.B., D.S.O., on his taking up his appointment at Lyness. The postal address of the new area is "Lyness, Orkneys," and the telegraphic address, "Naval Area, Lyness." Lyness is the promontory between Mill Bay and Ore Bay, on the mainland of Hoy, opposite the island of Fara. In the channel between Lyness and Fara the destroyers of the Grand Fleet at Scapa had their anchorage during the war.

Dover Dockyard Establishment was ordered to be closed on March 31st. Dockyard employees in Vote 8 departments at the Repair Base who belonged to other dockyards were ordered to be returned thereto, the remainder of the employees being given one month's notice of discharge, to take effect before the above date. A deputation of workmen from Dover was received by Dr. Macnamara and Rear-Admiral Sir William Nicholson on March 6th, but it was explained to them that the post-war needs of the Fleet did not justify a continuance of naval activities at Dover. The deputation was informed, however, that the points raised would receive the early attention of the departments concerned. At the beginning of March, said Dr. Macnamara, in reply to a question in Parliament, there were in the dockyard 360 employees, most of whom, he was afraid, would have to leave. Fifty of them were establishment men, or men usually employed in other yards, and these were to be invited to return to those yards.

A few other home bases were demobilized during the quarter. The Cardiff naval base was closed on February 12th. On January 14th, it was announced in Navy Orders that the naval base at Blyth had been closed since December 22nd, 1919. A similar notification was made at the same time that the R.N. Recruiting Office for the East London District, at the Grove, Stratford, was closed, and the appointment of the Medical Officer in this district was terminated. The Salvage Depôt at 187, High Street, Stratford, was also closed in January, and no further consignments of life-belts, etc., were ordered to be forwarded there. On February 14th, it was officially announced that the Airship Store Depôt at the White City had been closed, and the stores transferred to the airship station at Howden, which had become the main store depôt for airships under the Air Ministry. It was mentioned last quarter that orders had been issued for Dundee naval base to be closed down on or about January 1st. This base was closed down on March 1st. Engineer-Commander Black, the late Senior Naval Officer, and certain Admiralty overseers, were to remain at Dundee for a short period after this date to deal with outstanding claims. On March 15th, the Chart Depôt at Pembroke Dockyard was closed down.

The principal reduction effected in the foreign establishments, apart from transport bases, was that in Egypt. The office of the Rear-Admiral, Egypt, on the station, was closed on March 1st, and Rear-Admiral Henry B. Pelly, C.B., left Alexandria on March 3rd in the battleship "Cæsar" to return to England. Any communications regarding the disposal of stores and building material were to be addressed to Commander M. K. Burgess, R.N., care of the Disposal Board, Cairo.

Ten of the naval transport bases at home and abroad were demobilized. That at Beirut, Syrian Coast, was closed on January 19th; at Dieppe on February 15th; and at Havre on March 15th. The Naval Transport Office at Hull was closed on February 28th; and on March 31st the following transport bases were closed:—Glasgow, Devonport, Antwerp, Dunkirk, Calais, and Boulogne. All future communications respecting the transport bases demobilized during the quarter were ordered to be sent to Paymaster Rear-Admiral C. E. Byron, C.M.G., Room 40, Ministry of Shipping, St. James's Park, S.W.1.

A number of well-known vessels were placed on the Sale List during the period under review. In one list were the battle-cruiser "Indomitable," launched in 1907, and the first of her class and type to be completed for the British Navy; the cruisers "Berwick," "Devonshire," "Donegal," "Grafton," "Suffolk," and "Theseus"; 29 sloops; 12 paddle mine-sweepers; 17 twin-screw mine-sweepers; and the tunnel mine-sweepers "Morris Dance" and "Step Dance." In another list, seven 12-inch and 14-inch monitors appeared. Another, dated March 31st, contained the names of the battleships "Lord Nelson" (launched in 1906); the "Africa," "Dominion," "Hibernia," "Hindustan," and "Zealandia"—all that remained (with one exception, the "Commonwealth") of the eight vessels of the "King Edward VII." class; the "Queen," of the "Bulwark" class; and the famous original "Dreadnought," launched and completed in 1906. In an earlier list, there were the cruisers "Minotaur" and "Duke of Edinburgh," with some small craft. On March 3rd, 19 vessels of the "24 Class" sloops, headed by the "Ard Patrick," "Bend Or," and "Cicero," were marked down for sale; and on February 25th the sloop "Rosario," launched at Sheerness in 1898, and employed for twenty years on the China Station, was ordered to be sold at Hong Kong without any restriction as to breaking up, after the removal of her armament and any special fittings. During the war, the "Rosario" flew the flag of the Commander-in-Chief in China. Another interesting vessel placed on the sale list at Hong Kong was the cruiser "Kent," which served abroad throughout the war, and in the Falklands action caught and sank the "Nurnberg."

Naval Retirement Scheme.

On March 31st, the Admiralty made the following announcement:—"Owing to the increases made in the lists of officers during the war and the reduced number now required for the post-war Fleet, a considerable surplus of officers exists at the present time in some of the commissioned ranks of the Royal Navy, and in certain classes of warrant officers and officers promoted from warrant rank. In these circumstances it has been decided to offer the following special terms of retirement to officers of these ranks who retire voluntarily within a period of six months from April 1st, 1920. For officers serving on foreign stations the period will begin from the date of the receipt of this announcement on the station. The terms offered will be open only to officers of the ranks mentioned, and will be subject to the conditions hereinafter laid down." The accompanying schedule showed that for captains and commanders, retired pay would be granted on the scales previously in force, but no reduction would be made in the rates of retired pay if they were reassessed in 1924 or subsequently on account of changes in the cost of living. For lieutenant-commanders, lieutenants, and mates above 36 years of age, special retired pay was awarded, and a gratuity of £500. For those below this age, gratuities ranging from £500 for acting sub-lieutenants to £2,500 for lieutenant-commanders (with an addition of £200 for each year's seniority in the rank of lieutenant-commander), were awarded.

Navy Estimates, 1920-21.

On March 12th, the Navy Estimates for 1920-21 were issued. They showed an estimated net expenditure (after deducting appropriations in aid) of £84,372,300, as against £157,528,800 in 1919-20. The total number of officers, seamen, boys, coastguard, and Royal Marines given is 136,000, compared with 280,000 in the previous year. A sum of £76,671,900 is the net estimate of the amount required for effective services. This includes:—

Wages, etc.	£21,459,000
Victualling and clothing	7,864,300
Medical establishments and services	677,300
Civilians employed on fleet services	504,500
Educational services	430,300
Scientific services	302,000
Royal Naval Reserves	479,800

Shipbuilding, repairs, maintenance, etc., embraces the following:—

Personnel	£10,184,000
Material	8,499,000
Contract work	9,958,700

Other votes in the Estimates include the following:—

Naval armaments and aviation	£6,260,000
Works, buildings, and repairs at home and abroad	5,209,000
Miscellaneous effective services	3,290,000
Admiralty Office	1,554,000
Retired pay, pensions, gratuities, etc.	7,700,400

The total of the net Estimate for effective services in 1919-20 was £140,379,400. For non-effective services the net Estimate for 1920-21 is £7,700,400, against £17,149,400 last year. Pensions and compassionate allowances account for £4,402,775. The abstract of Navy Estimates for 1920-21 shows in the gross

estimate a grand total of £96,590,181, and appropriations in aid £12,217,881. The gross total last year was £172,798,776, and appropriations in aid £15,269,976, leaving a net estimate of £157,528,800. The contributions from India and the Colonies towards naval expenditure make up a total of £214,900, including £100,000 for maintenance of H.M. ships in Indian waters.

First Lord's Memorandum.

On March 15th, the Statement of the First Lord, explanatory of the Estimates was issued as a White Paper (Cmd. 619). Observing that a direct comparison with pre-war Estimates was of little value, an analysis was given of the non-recurrent war liabilities or terminal charges, the recurrent expenditure due to war conditions, and the normal expenditure on the basis of pre-war rates and prices. Following the usual financial statement, some "Notes on Naval Policy" were given by Mr. Long. These dealt with the strength of the seagoing fleet, the future of the capital ship, harbour and training establishments, scientific research, technical training, the entry and training of officers, reductions in the officer lists, promotion from the lower deck, the University training of naval officers, training for Staff duties, the War Staff organization at the Admiralty and in sea commands, air policy, the Dominion Naval Forces, the Welfare Committee, sports and recreations, Naval Reserves, and Fleet repairs. There was also an important "Note on Dockyard Policy," and two appendices, one dealing with the present Fleet Organization, showing the distribution of ships, and the other the organization for Scientific Research.

Naval Occurrences.

Australian Station Limits.—On January 1st, it was officially announced that the limits of the Australian Naval Station, which were laid down in Admiralty Monthly Order No. 1,435, dated April 23rd, 1919, had been accepted and had taken effect as from New Year's Day. On the east the boundary of the station follows the meridian of 160 degrees east of Greenwich from the Antarctic Circle to the Equator, with a slight extension further east about the parallel of 30 degrees south latitude. It therefore includes New Caledonia and the New Hebrides, but not the Fiji Islands, which are within the New Zealand station. The Solomon Islands and Bismarck Archipelago also come into the Australian station. The northern limits, which follow the Equator westward towards New Guinea, cross that island, and then virtually follow a line through the Torres Strait and Timor Sea to the Indian Ocean. The western boundary is on the meridian of 80 degrees east longitude.

Lower Deck Presentations. — In connection with a presentation by the townsfolk of Thanet to the British destroyer of that name, which took place at Ramsgate on December 13th, of a silver salver for the officers' mess, and a silver cake dish for the lower deck mess, it was stated that this was the first time that the lower deck had received recognition in this way. The Town Clerk of Chester wrote, however, pointing out that when H.M.S. "Chester" was commissioned the citizens of that town made a presentation to the men of the ship of a piano, clocks, band instruments and medals, a sum of over £220 being subscribed for this purpose in the city. These gifts were in each case made to the lower deck.

Naval Signals Committee.—On January 12th, the first meeting took place of a Committee which the Admiralty, with the concurrence of the Board of Trade, had appointed to deal with the revision of certain flags in the international code of signals so as to embody the latest war experience, which led

to such a large increase of signalling in the merchant service. The Great Powers signified their willingness to allow the foundations of this work to be undertaken by the British Government. At the request of the Admiralty, the Imperial Merchant Service Guild have nominated Captain E. G. O. Beuttler to represent the mercantile marine on this Committee.

NAVAL INSTRUCTOR BRANCH.—On January 14th, the Admiralty announced that the Naval Instructor Branch was to be re-instituted as a permanent Service, on a broader basis than was formerly the case, and in ships the duties of this branch are to include responsibility to the Captain for all scholastic instruction of officers and men. Revised rates of pay for the branch, as from 1st January, 1920, were published on April 1st.

SHIPS' COMMISSIONS.—On January 14th, the Admiralty announced that before coming to a decision on the subject of the re-introduction of three-years' commissions, orders for which were issued just before the War, but owing to hostilities had never become effective, it was desired to ascertain the views of the Service. Commanders-in-Chief and Senior Naval Officers were requested to take steps to enable them to render considered reports on the matter by the end of May.

"MALAYA" IN GERMAN WATERS.—On January 15th the Inter-Allied Naval Commission of Control, headed by Vice-Admiral Sir Edward Charlton, left Portsmouth in the battleship "Malaya" to inspect German naval bases and ships under the terms of the Peace Treaty. The "Malaya" saluted the German flag on arriving at Wilhelmshaven, the Admiralty having ordered that "now that a state of peace exists between the British Empire and Germany the German National Flag is to be saluted in accordance with the general rules in the King's Regulations and Admiralty Instructions."

ATLANTIC FLEET CRUISE.—On January 17th, the Atlantic Fleet, under Admiral Madden, rendezvoused at noon off Plymouth and left for a cruise to the Mediterranean. The ports and places to be visited included Arosa Bay, Pontevedra Bay, Gibraltar, Palma (Majorca), Alcudia Bay, and Algiers. In accordance with programme, the First Battle Squadron, under Vice-Admiral Fremantle, arrived at Malta on February 3rd and 4th. Leaving on the 17th, the vessels, instead of proceeding to Palma (Majorca), were ordered to Constantinople, arriving on the 22nd. The squadron remained there and cruised in the Black Sea during March. To celebrate the visit of the rest of the Fleet, under Admiral Madden, to Algiers on March 3rd, the Governor-General of Algeria gave a dinner in the Winter Palace. The ships were cordially welcomed at all the places visited.

NAVAL PHOTOGRAPHIC BRANCH.—In further development of the Naval Photographic Section, the establishment of which was noted last quarter, the Admiralty on January 24th invited applications for the posts of Fleet Photographic Officer, from officers not below the rank of Lieutenant, R.N., or R.M.; and Sloop Photographic Officers from warrant officers, R.N., or R.M. The former was to be on the Staff of the Commander-in-Chief, Atlantic or Mediterranean Fleet; and the latter in charge of the photographic ratings borne in the target-towing sloops.

"RIVER CLYDE" SOLD.—On January 28th, the steamship "River Clyde," employed in the Gallipoli landing, was sold in London for £11,500, and it was reported that she had been acquired on behalf of Spanish owners. The vessel left Malta on March 19th.

NEW NAVAL TITLES.—On January 28th, an order was published abolishing the collective expression and title of "Commissioned Warrant Officer" as being contradictory, and such officers were ordered to be referred to collectively as (*a*) "commissioned officers from warrant rank," when it is desired to refer only to officers of the grade lying between warrant officer and lieutenant; (*b*) "commissioned officers from warrant rank and above," when it is desired to refer to officers described at (*a*), together with Lieutenants, Lieutenant-Commanders, and Commanders promoted from warrant rank; and (*c*) "Warrant Officers and above," when it is desired to refer to the above together with warrant officers. Certain new titles were at the same time approved for warrant officers and above, up to the rank of lieutenant.

20TH FLOTILLA ABOLISHED.—On February 1st, the 20th Destroyer (Minelaying) Flotilla was abolished, following on its return from the Baltic. Captain Berwick Curtis, C.B., D.S.O., was awarded the C.M.G. for his valuable services in command of the Flotilla in Russian waters. The "Abdiel," leader of the Flotilla, was paid off and recommissioned for duty in the Nore Reserve. Sir Eric Geddes, when First Lord, described this Flotilla as "one of the *corps d'élite* in the Navy," and after describing how its vessels penetrated through the enemy minefields by night and mined inside them, he said he would give their crews the palm for the best, bravest, and pluckiest section of the Fleet.

THE WESTERN APPROACHES.—In the official "Navy List" for February, it was shown that the title of Admiral Sir Reginald Tupper, formerly Commander-in-Chief on the Coast of Ireland, had been changed to Commander-in-Chief of the Western Approaches. There are three captains, R.N., in charge of Naval Areas under his orders, the Irish Sea Area, Kingstown Area, and Buncrana Area.

VON TIRPITZ'S MEMOIRS.—On February 1st, the Admiralty stated that Admiral von Tirpitz's memoirs, recently published, contain a statement wholly contrary to fact, to the effect that British naval officers attached to Admiral Togo's staff during the Russo-Japanese War took an active and important part in the decisions of the Japanese command in action. As this allegation reflects on the professional reputation of a most distinguished Japanese admiral, the Secretary of State for Foreign Affairs has, at the request of the Admiralty, informed the Japanese Ambassador that it has the unqualified contradiction of his Majesty's Government.

COURSE FOR SECRETARIES.—On February 9th, the first of the new courses of instruction for accountant officers, who wish to qualify as secretaries, was begun at the old War College in Portsmouth Dockyard. Paymaster-Captain A. R. Parker, C.B., formerly Joint Secretary of the Admiralty Reconstruction Committee, was appointed Superintendent of the Course, and Paymaster-Commander Reginald Butcher, C.M.G., Assistant Superintendent. The course was to last three months, and a distinguishing mark (dagger in a circle) will be placed in the "Navy List" against the names of those who have qualified.

"VITTORIA" COURT-MARTIAL.—A naval Court-martial was held at Chatham on February 11th to inquire into the loss of the "Vittoria," destroyer, and the conduct of Lieutenant-Commander V. Hammersley-Heenan and the surviving officers and members of the crew. The narrative of Lieutenant-Commander Hammersley-Heenan set forth that on August 31st, when on patrol under the orders of the "Abdiel," the "Vittoria" was torpedoed by a hostile submarine. The ship was lying at anchor two miles from Seskar Lighthouse, when she was struck in the starboard side in the double cabin. She sank in five minutes.

Boats from the "Abdiel" picked up many men. Eight of the crew lost their lives. The Lieutenant-Commander, it was stated, was the last to jump overboard and when picked up he was supporting another man. The Court found that no blame was attributable to Lieutenant-Commander Hammersley-Heenan or any other surviving officer and that the conduct of the officers and men was in accordance with the best traditions of the Service.

MARINE CRAFT FOR R.A.F.—On February 14th, the Admiralty published the arrangements agreed upon between them and the Air Ministry as regards the employment of marine craft for and by the Royal Air Force. This work was divided into four categories, of which the first, normal work at seaplane stations, is to be carried out entirely by R.A.F. marine craft and personnel; the second, transport of aircraft between H.M. ships and R.A.F. stations, is also a responsibility of the R.A.F., but in cases where power-propelled marine craft of the R.A.F. are not available, an application for towage to be supplied by the Admiralty is to be submitted to the local Commander-in-Chief or Senior Naval Officer. The two other functions are the patrol of aerial routes, and special requirements such as the transport of personnel and stores over short open sea distances. Whenever it is necessary for naval craft to be provided for these purposes, an application to the Admiralty is to be forwarded, through the Air Ministry. On certain specified occasions, therefore, the Admiralty agreed, whenever possible, to meet the R.A.F. requirements.

MERCANTILE VESSELS IN DOCKYARDS.—On February 18th, in view of the necessity of completing Mercantile Marine vessels to meet national needs, the Admiralty ordered that none of the work on any of these vessels was to be regarded as a stand-by job, but all of it must be classed as urgent work and dealt with accordingly.

PEMBROKE DOCKYARD.—Early in February, the Admiralty received an offer from the Forth Shipbuilding Company to lease Pembroke Dockyard for thirty years. The Admiralty thereupon invited information from the workmen as to the numbers who would wish to be transferred to other royal yards rather than that their service under the Admiralty should be determined so that they might continue at Pembroke in the service of the firm. In his Memorandum dated March 12th, however, Mr. Long announced that it had been decided not to proceed further with the proposal to lease the yard.

"NEW ZEALAND'S" RETURN.—On February 2nd, the "New Zealand," Captain O. E. Leggett, flying the flag of Admiral of the Fleet Lord Jellicoe, arrived at Portsmouth after her Empire tour. She steamed 33,514 nautical miles with Lord Jellicoe, who also travelled for 16,589 statute miles on land, and the voyage lasted a year all but six days. Lord Jellicoe struck his flag on February 4th, and before doing so assembled the officers and crew aft and made a short farewell speech to them.

ENGINEERING TRAINING.—On February 21st, it was officially stated that the whole question of the future training of engineer officers, early specialization, and the devotion of increased time to engineering subjects, was receiving the attention of the Board. Instructions to be observed meanwhile were published in Admiralty Orders, which also contained a list of all (E) specialists and officers now specializing in (E) duties, showing the position of each officer in regard to the right of reversion to deck duties and military command under the regulations now in force.

CHILDREN'S ALLOWANCES.—The allowances to naval officers in respect of children were withdrawn on December 31st, 1919. Asked in February if he could make any statement as to the granting of such allowances to any rank of officers in the Navy, Mr. Walter Long said that he could only say that the grant of an allowance to certain ranks promoted from the lower deck was under consideration. Asked for information as to married quarters for officers, Mr. Long said it was not proposed to provide such quarters for Naval officers.

CASPIAN OPERATIONS.—On February 25th, the Admiralty issued an order for posting on all notice boards expressing to Commodore David T. Norris, C.B., and to the officers and men of the Caspian Flotilla, their warm appreciation of the good work performed in the Caspian Sea. The organization by which an efficient fighting force, said the Board, was evolved out of material necessarily inadequate reflects great credit on all concerned, not less than the brilliant manner in which the objects aimed at were achieved, when the Bolshevik naval forces were destroyed on May 21st, 1919, off Alexandrovsk.

DOVER PATROL MEMORIAL.—On February 27th, the Dover Patrol Memorial Committee met at luncheon the English-Speaking Union, for the purpose of presenting to the latter's secretary a cheque for £6,000 for him to convey to Mr. Daniels, U.S. Naval Secretary. This sum had been set aside by the Committee for a memorial in the United States similar to that at Dover. Mr. Walter Long presided, and said that the United States sent an invaluable contribution of warships to aid us in the War.

ADMIRAL NAPIER'S TOUR.—On March 1st, it was reported that Vice-Admiral Sir Trevylyan Napier, the newly-appointed Commander-in-Chief on the North American Station, had arrived in New York. He was making a tour which was to include a visit to the Naval Academy at Annapolis and an inspection of the plant of the General Electric Company at Schenectady.

NEW WAR COURSE OPENS.—On March 1st, the new War Course for Senior Officers began at the Royal Naval College, Greenwich, under the direction of Rear-Admiral H. W. Richmond. For this first course under the post-war regime the number of officers attending was limited to 20, and included no commanders. The Admiralty ordered that plain clothes were to be worn during the course.

MIDSHIPMEN'S ACCOMMODATION.—An Admiralty Order of March 3rd stated that owing to the lack of accommodation for the midshipmen passing out of the training cruisers in May, it had been decided that those due for examination for lieutenant in that month were to be examined afloat. The seamanship and engineering examinations were to be final; those in navigation, gunnery and torpedo preliminary. The successful candidates were to be appointed away from their present ships as soon as the results were known in order to provide accommodation for the new midshipmen.

"THRACIAN" LAUNCHED.—On March 5th, the destroyer "Thracian" was launched from the yard of Messrs. Hawthorn Leslie and Co., at Hebburn, Durham. She was the last of four of the modified "S" class ("Trenchant" type) ordered from this firm in June, 1917.

"HOOD'S" TRIALS.—The new battle-cruiser "Hood" left Rosyth on March 5th for the Firth of Clyde to run her trials. She had been fitted while at Rosyth with several new labour-saving devices, and was the first big ship in the Navy to possess oil-burning kitchen ranges. It is estimated that 1,400 dinners can be served in ten minutes from the cook's quarters, and the ship's bakery, with its oil-fired furnaces, is capable of producing 1,400 lbs. of bread a day.

DESIGN OF THE SHIP.—A paper on the design of the "Hood" was read by Sir Eustace d'Eyncourt on March 24th at the Institution of Naval Architects. The Director of Naval Construction said that the endeavour had been to embody the armament and armour protection of a first-class battleship, including also good under-water protection against torpedoes, with the speed of the fastest battle-cruisers. In the discussion on the paper, Lord Jellicoe, Sir Philip Watts, Captain Sir Alfred Chatfield, and Constructor-Commander E. S. Land, U.S.N., took part.

THE OFFICIAL NAVAL HISTORY.—On March 11th, the first volume was published of the Official Naval History of the War, by Sir Julian Corbett, dealing with the naval operations up to and including the Battle of the Falklands on December 8th, 1914. In a written answer to a question in Parliament on March 18th, the Financial Secretary to the Treasury said that it was not possible to estimate with accuracy the total cost of the official histories of the War, when completed, particularly as the staff engaged were also employed on other duties, but "with considerable reserve, I give the following figures:—Naval History, £23,000; Air History, £10,000; History of Seaborne Trade, £2,000; and History of Merchant Navy, £3,200. It is impossible at the present time to give even an approximate estimate of the cost of the Military History, or of the receipts from sales."

LOSS IN THE "GLOWWORM."—On March 10th, the First Lord in reply to a question stated that H.M.S. "Glowworm" was not sunk, nor was she destroyed by the explosion at Meleberreznik, on the Dvina. She was proceeding alongside a barge which was on fire, in order to assist in extinguishing it, when the barge blew up, the commanding officer of the "Glowworm" being unaware that it contained ammunition. There is not a word of truth in the story that 90 ratings were under confinement. The following were killed or died of wounds caused by the explosion:—The commanding officer (Commander S. W. B. Green, D.S.O., R.N.), four British officers, two Russian officers, 17 men; and two officers and 13 men were injured.

BELGIAN SALVAGE OPERATIONS.—On March 10th, work was reported to be in progress on the raising from the Zeebrugge Canal of the British ex-cruisers "Thetis," "Iphigenia," and "Intrepid," which, filled with cement, were sunk by their crews in the raid of April 23rd, 1918. Commodore F. W. Young, who is in charge of the operations, as Naval Salvage Adviser to the Admiralty, has been awarded the Cross of Officer of the Crown by the King of the Belgians. Answering Viscount Curzon, Dr. Macnamara said he could not say anything definite about the "Vindictive," which, amongst other things, broke her back. Operations were in progress to remove her to a place where she would not be an obstruction. Thereafter a decision would be taken as to her ultimate disposal.

HOSPITALS FOR SEAMEN.—On March 11th, at the Annual Court of Governors of the Seamen's Hospital Society, Lord Beatty said that to-day the great need was for a sanatorium for tuberculosis for sailors, who, unlike the general population, had none of the advantages of men with permanent domiciles, and were seldom able to obtain proper care and treatment. It was not charity that was asked; it was a duty to look after these men, a duty to the generations to come.

THE DANUBE FLOTILLA.—Writing on March 12th, the Vienna Correspondent of *The Times* stated that Admiral Sir Ernest Troubridge had given up the command of the British Danube Flotilla, and had been succeeded by Captain John F. Warton, C.M.G., C.B.E., R.N. This step rendered it possible for the

Admiral, as President of the Inter-Allied Danube Commission, to make an extended tour of inspection of the Danube. He left Budapest on March 15th, accompanied by other members of the Commission, and, travelling in the yacht "Szofia," was to visit Danube ports as far apart as Regensburg and Turnu Severin, before finally returning to Budapest on April 11th.

FLOTILLA'S COMPOSITION.—The river gunboat, "Glowworm," was re-commissioned at Chatham on March 25th to fly the pennant of Captain Warton. Two other gunboats, the "Aphis" and "Ladybird," and ten motor-launches, comprise the Danube Flotilla at present. The gunboats are among those built by Messrs. Yarrow in 1915 for duty on the Tigris and elsewhere.

"DARTMOUTH" IN COLLISION.—On March 13th, a message from Monte Video stated that the light cruiser "Dartmouth," Captain H. W. W. Hope, had been in collision during a storm with the Italian steamer "Crema," of 4,945 tons, and that both vessels had been damaged. The "Dartmouth," which had been at Monte Video since February 24th, was able to leave there, however, on March 21st for Maldonado.

WITHDRAWALS FROM DARTMOUTH.—On March 12th, the Admiralty announced that owing to the smaller number of officers likely to be required for the Fleet under post-war conditions, the number of cadets at the Royal Naval Colleges and in the training cruisers is now much in excess of requirements. In order to effect the necessary reduction the parents or guardians of cadets of all terms, who entered Osborne between May, 1916, and January, 1919, inclusive, and the "special entry" term of July, 1918, have been given the option of voluntarily withdrawing their sons or wards, and in cases where this option is exercised before July 15th next, and the cadet withdrawn before or at the end of the summer term, 1920, a withdrawal grant of £300 is being made in consideration of any expenses that may be incurred in making other arrangements for the cadet's future. A notice to this effect has already been sent to those concerned. The withdrawals, in the case of cadets who entered Osborne between September, 1916, and January, 1919, will amount to approximately 40 per cent., and should the numbers not be sufficiently reduced by voluntary withdrawals, the remainder of the cadets to be withdrawn will be selected by the Admiralty, at the end of their course of training at Dartmouth, as a result of the order in which the cadets are then placed. This compulsory reduction will not apply to those already on board the training cruisers, or to those due to pass out of Dartmouth in April next. The withdrawal grant will not be allowed in the case of cadets who are withdrawn in consequence of not reaching a satisfactory standard, or for unsatisfactory conduct, or unsuitability.

ADMIRAL STURDEE ON THE FALKLANDS.—On March 18th, Admiral Sir Doveton Sturdee was presented by the Corporation of Lloyd's with a silver-gilt vase in recognition of his distinguished services, and was made an honorary member of Lloyd's. "I have a great regard for my opponent, Admiral Von Spee," said Sir Doveton in his speech. "He was a German, he was an enemy, but he was a gentleman, and he spoke very nicely after the affair of Coronel about our admiral and the British Navy. I think we ought to remember that, because we do not always think the Germans truthful. He gave our squadron a chance by coming to call the day after I arrived. He came at a very convenient hour, because I had just about finished dressing, and was able to give orders to raise steam at full speed and go down and have a very good breakfast."

"RENOWN'S" CRUISE.—On March 16th, the Prince of Wales left Portsmouth in the "Renown" on his second Dominion tour, to Australia and New Zealand.

The start had been delayed a week owing to the "Renown" having to be placed in quarantine owing to an influenza outbreak. The Prince was received on arriving at the South Railway Jetty at Portsmouth by Sir Cecil Burney, Commander-in-Chief, Sir Charles Vaughan-Lee, Admiral Superintendent, Lieutenant-General Montague Harper, Commanding the Southern Command, and others, and went straight on board the "Renown," when his standard was broken at the mainmast. Prince Albert and Prince Henry also proceeded on board and had tea with the Prince before the vessel sailed at 5.45 p.m.

"Frobisher" Launched.—On March 20th, the light cruiser "Frobisher" was launched at Devonport Dockyard by the Countess Fortescue, wife of the Lord-Lieutenant of Devon, and a distinguished company assembled to witness this first post-war launch at Devonport, which took place in brilliant weather. The "Frobisher" will be of 9,750 tons, with a length of 605 ft. overall, and a draught of 17 ft. at mean load. She will carry seven 7.5-in. guns and six 3-in., with four 3-in. anti-aircraft guns, as well as four upper-deck and two submerged torpedo tubes.

Seamen for Tank Corps.—On March 20th, the Admiralty announced that the War Office had vacancies for certain branches of naval ratings in the Tank Corps, and men actually due for discharge were therefore to be invited, provided they had had experience in any of the fifteen trades in which there were vacancies, to transfer to this Corps. The services of practically any engine-room artificers or men with a working knowledge of marine and internal combustion engines were asked for.

Admiral Scheer's Book.—On March 22nd, Messrs. Cassell & Co. published "Germany's High Sea Fleet in the World War," written by Admiral Reinhold Scheer, the former Commander-in-Chief, who was in command at the Jutland battle. On February 18th, Mr. Long, replying to questions, said that he hoped the Admiralty official narrative of Jutland would be published in a little over a month. "The Admiralty," he added, "are in possession of a report by Admiral Scheer, the German Commander-in-Chief, on the battle, and have decided to publish it as an appendix to the official narrative. This report has been utilized to check the information available from our own records."

New Sports Branch.—On March 22nd, Captain Robin C. Dalglish, R.N., formerly Superintendent of Physical and Recreational Training, Portsmouth, was appointed to the Admiralty as Director of the new Physical Training and Sports Branch. The work of this branch will include: (1) Physical and Recreational Training; (2) Sports and Recreations; and (3) Cruising Clubs and Accommodation Registers, and similar projects for the welfare of the personnel. The new branch absorbed the Sports Control Board, and Engineer-Commander E. W. Roberts, appointed Assistant Director of Physical and Recreational Training, became Secretary of the Board, of which the President is the Second Sea Lord.

Trawler Lost.—On March 22nd, after Government tugs had succeeded in floating the Admiralty trawler, "James Fennell," which had been on the rocks at Blacknor, Portland, since January 18th, the vessel suddenly turned turtle and sank. The men on board her jumped overboard and were rescued.

Withdrawal of Midshipmen.—On March 24th, the Secretary of the Admiralty announced that, in view of the surplus of officers resulting from the reduction in the Fleet on the termination of the War, it has been decided to give parents or guardians of midshipmen the opportunity of withdrawing their sons or wards from the Navy in order to place them in some other walk of life. The

resulting reduction should give improved prospects of promotion to the officers who remain. If the withdrawal is made on or before September 15th next, a withdrawal grant of £400 will be made in each case in consideration of any expenses to which parents or guardians may be put in making other arrangements for the future. Applications for withdrawal will be dealt with in order of receipt, and when the desired reduction has been made no further applications will be considered. The withdrawal grant will not be paid in cases where a midshipman is liable to discharge under the ordinary regulations for unsatisfactory conduct or incapacity, and the Admiralty reserve the right of withholding permission for withdrawals in cases where disciplinary action is pending. The necessary notification has been sent to those concerned. These arrangements will apply only to midshipmen, R.N., and will not be retrospective. Midshipmen, R.N.R. and R.N.V.R., and paymaster-midshipmen, R.N., are not included.

POST-WAR COMMITTEE DISPERSED.—On March 27th, the Post-War Questions Committee at the Admiralty dispersed. Rear-Admiral Sir Richard Phillimore was the President of this Committee, which was appointed in June, 1919, and to which the Board referred certain questions connected with the experiences of the War.

NAVAL DRIFTERS FOR FISHING.—On March 27th, it was announced that, in accordance with a Cabinet decision, arrangements are being made to turn over the 150 surplus Admiralty drifters, adapted for fishing purposes, to the Fishery Boards for disposal. No winches are to be removed from standard Admiralty drifters paid off and lying at Brightlingsea and other bases without the prior sanction of the Admiralty. The 200 Admiralty trawlers reconditioning in the dockyards for the Minesweepers Co-operative Trawling Society are ordered to be completed with naval stores to their pertinent specification as a charge to Vote 8, Section II., of the Navy Estimates.

AEROPLANES AT SEA.—In reference to a report which had been made that, for the first time, an aeroplane was successful in rising from and alighting on the flying deck of the aircraft carrier attached to the Atlantic Fleet, the Sopwith Aviation Company wrote to *The Times* on March 27th that machines of their manufacture had performed this feat, certainly in 1917, and they believed earlier than that. Photographs of this were shown at the R.A.F. Exhibition at the Grafton Galleries in April, 1918. In *The Times* on March 25th, it was stated that the flying feat off Vigo was performed on the deck of the "Argus," and not the "Furious," as at first reported. The achievement had been several times repeated, and was described as almost of daily occurrence.

THE MERCANTILE MARINE.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—During the past thirty-one years it has been my privilege to contribute at different times various lectures and papers dealing with the Royal Naval Reserve to the JOURNAL of the Institution, the last being in November, 1914, when I showed that, in response to the order calling out the Reserves, upwards of fifty per cent. of the men joined the pennant within forty-eight hours. In fact, they came forward so readily that it was difficult to dispose of all of them at once.

Of the work of the Royal Naval Reserve in the War nothing need here be said, for the following list of honours and awards, kindly furnished me by Mr. C. H. Jones, C.B.E., Registrar-General of Shipping and Seamen, and for the publication of which Admiralty sanction has been given, speaks for itself.

I am, Sir, etc.,

W. F. CABORNE,

Commander, R.N.R.

HONOURS AWARDED TO COMMISSIONED AND WARRANT OFFICERS, R.N.R. (WITH THE EXCEPTION OF SKIPPERS, TRAWLER SECTION), FOR SERVICE DURING THE WAR, ALSO MENTIONS AND APPRECIATIONS.

K.C.B.		1
K.C.M.G.		1
K.B.E.		5
C.B.		4
C.S.I.		1
C.M.G.		1
C.B.E.		36
O.B.E.		232
M.B.E.		29
		310
Victoria Cross	7	
Distinguished Service Order	121	
Bar to D.S.O.	8	
Distinguished Service Cross	445	
Bar to D.S.C.	30	
Foreign Orders	125	
		736
Military Cross	2	
		2
Mentions and Appreciations	957	
		957
Total		2,005

April, 1920.

ROYAL NAVAL RESERVE.

LIST OF HONOURS, AWARDS, ETC. (WARRANT OFFICERS, TRAWLER SECTION, AND RATINGS), FOR SERVICE DURING THE WAR.

Particulars of Award.	Ordinary R.N.R. Force.	Ranks and Ratings Trawler Section, R.N.R.	Shetland Section.	Total.
Victoria Cross	2	2	—	4
Conspicuous Gallantry Medal	8	9	—	17
Distinguished Service Cross	—	175	—	175
Bar to D.S.C.	—	4	—	4
Distinguished Service Medal	261	483	5	749
Bar to D.S.M.	5	6	—	11
British Empire Order (Military Division)	—	13	—	13
Meritorious Service Medal	34	59	—	93
Mentioned in Despatches	253	566	8	827
Appreciation and Commendation	100	328	3	431
Noted for War Services	124	256	2	382
Monetary Awards	4	32	—	36
Royal Albert Gold Medal	1	3	—	4
Royal Victorian Medal	—	2	—	2
Board of Trade Gallantry Medal	7	3	—	10
Royal Humane Society's Awards	21	24	—	45
National Lifeboat Institution Medal	1	—	—	1
Carnegie Honorary Certificate	2	—	—	2
FOREIGN AWARDS.				
Croix de Guerre (French)	6	28	—	34
Medaille Militaire (French)	13	32	—	45
Ordre de Leopold II. (Belgian)	1	—	—	1
Silver Medal for Military Valour (Italian)	2	10	—	12
Bronze Medal for Military Valour (Italian)	14	46	—	60
Gold Medal (Serbian)	6	79	—	85
D.C.M. (Roumanian)	7	8	—	15
Gold Medal (Russian)	—	3	—	3
Silver Medal (Russian)	3	28	3	34
Medal, For Zeal (Russian)	93	14	—	107
St. Anne's Badge (Russian)	—	6	—	6
St. George's Medal (Russian)	4	1	—	5
Chevalier's Cross (Greek)	—	1	—	1
Silver Medal (Norwegian)	2	—	—	2
Life Saving Medal (French)	—	3	—	3
Medal and Clasp Al Valore di Marine (Italian)	—	1	—	1
Total	974	2,225	21	3,220

MILITARY NOTES.

JANUARY—MARCH, 1920.

United Kingdom.

Army Estimates.—On February 17th, the Army Estimates for 1920-21 were published. They totalled £125,000,000 for the year; including £55,000,000 for establishments, as in 1914-15, £29,500,000 for terminal charges of the war, £40,500,000 for garrisons of occupied territories. Under the last heading £5,000,000 was recoverable. £75,000,000 was required on account.

Vote A gave the establishment, exclusive of India, as :—

	1920-21.			1914-15.		
	Offic'rs.[1]	Other ranks.[1]	All ranks.[1]	Officers.	Other ranks.	All ranks.
I.—British Troops—						
Regimental Establishments.						
Cavalry, including Household Cavalry	662	14,014	14,676	547	14,162	14,709
Royal Artillery	1,570	27,505	29,075	1,313	31,256	32,569
Royal Engineers	1,284	12,656	13,940	695	9,197	9,892
Signal Service	370	7,401	7,771	—	—	—
Royal Flying Corps (Military Wing)	—	—	—	165	1,264	1,429
Infantry, including Foot Guards	4,115	110,088	114,203	3,414	92,385	95,799
Machine-gun Corps	115	2,732	2,847	—	—	—
Tank Corps	179	3,421	3,600	—	—	—
Royal Army Service Corps	979	13,874	14,853	456	5,849	6,305
Royal Army Medical Corps	1,723	10,602	12,325	663	3,797	4,460
Royal Army Ordnance Corps	628	5,453	6,081	232	2,196	2,428
Royal Army Veterinary Corps	149	587	736	99	249	348
Army Pay Corps	—	1,456	1,456	—	561	561
Corps of Military Accountants	290	1,201	1,491	—	—	—
Total, Regimental Establishments	12,064	210,990	223,054	7,584	160,916	168,500
Permanent Staff of Territorial Force, etc.						
Territorial Force	576	2,425	3,001	600	2,206	2,806
Officers Training Corps	13	54	67	13	54	67
Channel Islands and Colonial Militia, etc.	16	169	185	16	169	185
Total, Permanent Staff	605	2,648	3,253	629	2,429	3,058
Staff and Departments.						
War Office Staff, Staff of Commands, Recruiting Staff, Army Pay Department, Royal Army Chaplains Department, etc.	2,470	2,737	5,207	1,111	131	1,242
Miscellaneous Establishments, including Schools of Instruction, etc.	1,695	5,580	7,275	398	1,131	1,529
Total, British Troops	16,834	221,955	238,789	9,722	164,607	174,329
II.—Colonial and Indian Troops	3,877	105,766	109,643	300	8,471	8,771
III.—Additional Numbers temporarily borne on the strength (war-time sick and wounded, men in course of demobilization, etc.)			176,568	—	—	3,300
Number to be voted			525,000	—	—	186,400

[1] Figures provisional: establishments of the several arms and ranks not yet fixed.

The total of 525,000, which represents the maximum for which Parliamentary authority was required, was expected to fall, in the course of the financial year, to about 280,000, including Colonial and Indian troops serving outside India. It compared with 2,600,000 in 1919-20.

Approximate distribution of the establishment of the Army, exclusive of India, on April 1st, 1920, was :—

	British troops.		Colonial and Indian troops.		Total all ranks.	
	Officers	Other ranks.	Officers.	Other ranks.	British troops.	Colonial and Indian troops.
I.—Home	11,599	149,535	—	—	161,134	—
II.—Colonies	601	9,009	348	9,909	9,610	10,257
III.—Other Territories.[1]						
1. The Rhine and Plebiscitary areas	794	15,880	—	—	16,674	—
2. Constantinople	606	8,522	500	13,218	9,128	13,718
3. Egypt	732	10,873	580	19,883	11,605	20,463
4. Palestine	668	9,172	620	12,554	9,840	13,174
5. Mesopotamia (including North-West Persia)	1,240	17,332	1,829	50,202	18,572	52,031
6. Foreign Missions and Miscellaneous	594	1,632	—	—	2,226	—
Total, other territories ...	4,634	63,411	3,529	95,857	68,015	99,386
Total	16,834	221,955	3,877	105,766	238,789	109,643
					348,432	

[1] These garrisons are in process of reduction to approximately half their present strength as local circumstances permit.

On February 23rd the Vote on account for £75,000,000 was introduced. The War Secretary said :—

1. Conscription would be abolished by March 31st, demobilization completed during April. By that time, the new volunteer Army would number about 220,000, exclusive of India.

2. Conscription had been abolished in Germany, under compulsion. It was retained in France, Italy, Japan, Spain, Portugal, Switzerland, Norway, Sweden, Holland, Denmark, Rumania, Greece, Poland, Yugo-Slavia, Czecho-Slovakia, the United States, and Russia.

3. The pre-war strength was 175,000 British troops, exclusive of India, 90,000 Indian, serving out of India. 109,000 Indian troops would be retained during the year outside India.

4. New responsibilities entailed the maintenance of 16,000 men on the Rhine and in Germany; 9,000 British, 14,000 Indian troops at and around Constantinople; 6,000 British, 20,000 Indian troops in Egypt; a brigade in north-west Persia; 10,000 British, 13,000 Indian troops in Palestine; 17,000 British, 44,000 Indian troops in Mesopotamia.

5. Increased cost was due to the pay having been multiplied two-and-a-half times while the value of £1 had fallen to 8s. 10d.

6. Out of a population of 45,000,000, about 175,000, or 1/250th part, were taken before the war for Imperial defence, apart from Indian needs.

7. The charge for the normal Army was £55,000,000, instead of £63,000,000, because we were living for the next two years on stocks of material, etc., in hand, and the Reserves, Militia, and Territorials were not expected to reach the approved scale till late in the financial year.

8. Three or four years would be needed to get the same money value out of the Army as was attained before the war.

9. A steady increase of the Air Force at the expense of the Navy and Army was favoured. It had been in command during the Somaliland campaign and had achieved for £30,000 what would probably have cost £6,000,000. The Chief of the Air Staff had been directed to submit an alternative scheme for the control of Mesopotamia. If the Air Force became responsible there, naval and military units would be placed under its command. The matter was being studied by the Air Ministry and War Office staffs.

10. A new tank had been produced capable of moving 20 miles an hour, or 1,000 miles without appreciable wear and tear, without damaging the roads. A grenade had also been invented, which can be fired from a rifle and mortally wound a tank. The subject was in an experimental stage.

11. The pre-war Army, with its reserves, was being reconstituted. Units would be distributed, half at home and half abroad, "in accordance with unshakable Cardwellian tradition." On mobilization, the units at home would form an Expeditionary Force of one cavalry and six infantry divisions. Behind them would be the Militia, 74 battalions of which "may" be able to take the field after a few months, developing into six additional divisions. The above composed the first line. In the second would be one Yeomanry and 14 Territorial divisions, available in two months after mobilization. Apart from the Militia, the Territorial Army would be the normal means of expansion. On mobilization, each division would throw off a second division. Until the passing of a General Service Act, men would serve at home or abroad in their own units..

12. If the recruiting response for the Territorial Army was inadequate, an extension of the Army Reserve would be proposed.

13. Arrangements for India and with the Dominions were under discussion.

The Vote was passed.

On February 23rd, in amplification of the above statement, a memorandum was issued on the work of the War Office since the Armistice.

A. Imperial General Staff.—Lessons of the war had been studied and reported on by committees appointed by the General Staff. Experimental brigades would be formed at leading training centres to try out tactical changes. After these tests, the future organization would be finally decided. Education would be part of the normal training of the soldier; regimental officers responsible for the elementary part, assisted by an education corps. Staff College was reopened last year. From 1922 there would be a larger percentage of nominations. During 1916-18 the ranks supplied 95 per cent. of our officers. Schools for N.C.O.'s qualifying for commissions would be started in 1922 with a batch of 60 students. Officers Training Corps had been resumed under pre-war conditions in collaboration with university and great school authorities. There were 30,961 cadets as against 21,539 in 1914.

Tanks.—There would be no separate corps at present. Officers will be seconded for, and men posted as nucleus to, tank units. New tanks have been developed (see above), two sent to India experimentally. A corps of signals would be established. M.G.C., tentatively, a machine-gun troop or platoon would be added to regimental headquarters. The Army Sports Control Board had secured over 500 grounds.

B. Adjutant General: Army Reserve.—A sufficient number of men who served in the war will be enlisted, without again joining the ranks, to make up pre-war strength of the Expeditionary Force on mobilization.

Demobilization.—Since the Armistice 173,000 officers, 3,745,000 men (including 24,600 officers, 249,000 men, R.A.F.), 96,700 women, have been demobilized. There remain 125,000 men to be demobilized, distributed as follows:—On the Rhine, 26,000; France and Flanders, 11,300; Italy, 600; Black Sea, 5,200, Egypt, 20,700; India, 900, plus 500 at sea *en route;* Mesopotamia, 2,000, plus 5,000 at sea; else-

where abroad, 800; at home, 50,000. 115,000 will be demobilized by March 31st, the remainder during April.

Recruiting.—Since January 15th, 1919, 156,991 men enlisted, but 40,000 of these for France and Flanders. Men are, therefore, still required on normal engagements. 7,546 lads between 17 and 18, and boys for technical establishments, have also been enlisted. Except for technical trades needed, recruiting proceeded satisfactorily.

Revision of Sentences.—At the beginning of 1919, 350 men were in penal servitude, 1,600 in imprisonment. All sentences were reviewed, and there remain 200 in penal servitude, none imprisoned, except for civil offences. 40,000 to 50,000 men benefited under the Suspension of Sentences Act.

Prisoners of War.—7,113 cases were investigated, 20 Courts of Enquiry, and 14 Courts-Martial held, in 41 cases disciplinary action taken, 7,050 cases cleared after investigation. The vast majority of surrenders were due to indomitable courage which fought to the last and refused to retire.

Enemy Prisoners.—350,000 had been repatriated, 70,000 Germans were temporarily retained in Egypt through sickness, 50,000 Turks for want of transport.

R.A.M.C.—The pre-war establishment was 1,068 officers, 3,895 men. At the Armistice there were 14,461 officers and 1,524 civilian practitioners, 131,361 men, 18,660 V.A.D.'s, etc. Present strength is 3,336 officers, 322 civil practitioners, 18,412 men, 4,771 V.A.D.'s, etc.

A Dental Corps is proposed of 110 officers, 132 men.

Vaccine Department, R.A. Medical College, despatched over 33,000,000 doses of vaccines against typhoid, cholera, dysentery, etc., during the last five years. Amongst the troops in France there were only 7,423 cases of typhoid, with 266 deaths. The Boer War cost us 57,684 cases, with 8,022 deaths. In the French Army, before fully protected by inoculation, there were 95,809 cases, with 11,690 deaths, up to November, 1915. The Germans lost 7,751 men from typhoid.

R.A.S.C. before the war consisted of 456 officers, 5,790 men; by November 11th, 1918, of 11,364 officers, 314,824 men. Present strength, including India, is 3,387 officers, 36,764 men.

C. Quarter-Master-General.—A number of statistics were furnished, and it was stated in conclusion as generally recognized "that the British armies were the best equipped and fed of any troops in the field."

Strength.—On March 15th the strength was:—Rhine, 19,823; France and Flanders, 27,814, Black Sea, 8,562; Egypt, 30,150, Mesopotamia, 10,651; India, 62,579; home, 200,737; total, 380,310. Of these 73,071 were demobilizable, 18,131 volunteers, 289,198 regulars (including re-enlisted and one-year men). 137,656 Indian troops were serving outside India (16,000 on the Black Sea, 48,000 in Egypt, 67,000 in Mesopotamia).

On March 23rd recruiting was reported "good," 3,000 men being "sometimes" enlisted weekly.

Militia.—On March 23rd the War Secretary stated:—74 or 75 battalions would be maintained, one per each regular battalion, one per each two-battalion regular regiment as a draft finding unit. Most of the extra Special Reserve would be eliminated.

Territorial Army.—On January 30th, at a meeting of representatives of the Territorial Force Associations, the War Secretary outlined the Government scheme for the reconstitution of the Territorial Force. It proposed:—

1. Army organization in two self-contained main branches. A.—Regular Army, including Special Reserve battalions, Reserve. Special Reserve to revert to old constitutional name of Militia. B.—Territorial Force, to be called Territorial Army, and to be the sole means of expansion in war. In future emergencies no new armies to be raised.

2. Object of B: Imperial defence, including our obligations in France and Flanders. But (*a*) embodiment only by Royal Proclamation after Reserve has been called out; (*b*) foreign service only after fresh Act of Parliament; (*c*) not to find drafts for Regulars, but fight as units, as soon as efficiency warrants, by brigades and divisions; (*d*) divisions, on proceeding abroad, to leave behind cadres to (i) furnish drafts, (ii) form any new divisions required.

3. Recruiting to commence on February 16th.

4. Terms of engagement: Men between 18 and 38, fit for general service. Three years' enlistment for trained men who served six months in the war, four years for others. Special enlistment of (*a*) older men for certain specific units; (*b*) selected men for appointments above rank of sergeant; (*c*) cadets over 17.

5. Training, drills, and musketry as before the war.

6. Pay and allowances: During training, at Regular rates, including separation allowances. Bounties up to £3 for trained men, £4 for others.

7. Officers: Divisional, brigade, and regimental commanders to be chosen from those who have commanded such during the war.

8. Machine-Gun and Tank Corps: temporarily as at present, eventually as in Regulars.

9. Strength: War establishment 345,000. In the first instance 60 per cent. to be recruited, latitude being given to vary strength of corps per division in order to preserve the greatest number of cadres available for expansion.

10. Yeomanry: To be reduced from 55 regiments to a division of 10 or 12. Remainder to (*a*) have the same liability to foreign service as King Edward's Horse; (*b*) form field and mountain artillery, motor machine-gun corps. A conference of Yeomanry authorities to discuss (*a*), (*b*).

On March 9th, at a meeting of representative Yeomanry officers, the War Secretary said:—All Yeomanry regiments would be provisionally reconstituted as cavalry. They would be recruited up to full strength of officers, 60 per cent. of men, on the basis of three squadrons per corps, ten regiments would form the 2nd cavalry division, the remainder not be brigaded. Within two years, the latter would be asked to consent to the conversion proposed above; men unwilling to accept it would be free to take their discharge.

Royal Air Force.—On March 8th, the Air Estimates for 1920-1 were published:—

	Net Estimate, 1920-21.	Net Estimate, 1919-20.
I.—Numbers.	Total Numbers.	Total Numbers.
Total number of Officers, Warrant Officers, Non-commissioned Officers, Airmen and Boys on the Establishment of the Royal Air Force, exclusive of those serving in India	29,730	150,000
II.—Effective Services.	£	£
Pay, etc., of the Air Force	4,651,000	21,051,000
Quartering, Stores (except Technical Supplies, and Transport)	2,005,000	6,103,000
Technical and Warlike Stores	6,172,850	19,322,850
Works, Buildings, and Lands	3,647,000	6,402,000
Air Ministry	877,000	692,000
Miscellaneous Effective Services	110,000	203,000
Civil Aviation	894,540	—
Experimental and Research Services	2,575,540	—
Total Effective Services	20,942,930	53,773,850
III.—Non-Effective Services.		
Half-pay, Pensions, and other Non-Effective Services ...	114,000	257,000
Total Effective and Non-effective Services ...	21,056,930	54,030,850

On March 11th, in submitting the Estimates, the Under-Secretary for Air said :—

1. Excluding charges under war liabilities, but including separation allowances, the Estimates closely approximated to the £15,566,500 laid down a year ago as the normal expenditure for the next five years. They also included sums for civil aviation and research work, not chargeable in war time to the Air Ministry.

2. On March 31st, 1919, the strength was 22,000 officers, 160,000 men, 14,000 civilians, 22,000 W.R.A.F. On March 31st, 1920, it would be 3,280 officers (normal strength 2,850), 25,000 men (normal strength 23,300), 6,000 civilians, W.R.A.F. demobilized.

3. 149 aerodromes, 122 landing grounds, 2,240 hirings had been given up.

4. In India, the Commander-in-Chief had stated the services of the R.A.F. appreciably shortened operations. In Egypt, it was hoped to have seven squadrons by next month. In Mesopotamia, Russia, and near Aden valuable help had been given. In Somaliland, twelve planes took a decisive part in bringing operations to a close in three weeks.

5. Five rigid, 87 non-rigid airships, 14 stations in commission in 1919, were being reduced to one rigid, three non-rigid airships, one permanent station.

6. Fifty-two cadets, including 17 midshipmen, transferred from the Navy, were at Cranwell College.

Russia.—On January 17th, there were with the military missions in the Baltic, 30 officers, 20 men; in Finland, 10 officers, 18 men; in Poland, 12 officers, 12 men; with General Denikin, 394 officers, 1,529 men (including 93 officers, 291 men, R.A.F.). Twenty-eight officers, 455 men, were prisoners.

On March 7th, there were in Siberia 59 officers, 67 men, under recall. Twelve officers, six men were known to be prisoners; four officers were reported to have been shot. On March 16th, 103 of all ranks were in Siberia, 1,750 (including R.N. and R.A.F.) in South Russia.

Prisoners were being repatriated during March.

General Headquarters, Great Britain, was closed on February 1st. A letter of thanks for his great services was addressed to Field-Marshal Lord Haig by the War Secretary.

West African Units.—On March 7th, it was notified that subalterns aged over 22 were required for the Nigerian, Gold Coast, Sierra Leone, and Gambia corps. Pay ranged from £360 to £312 yearly for Lieutenants of artillery, £350 to £300 for those of infantry, plus £120 bonus (£170 on Gold Coast), and 10s. daily allowances.

Dress.—On March 23rd, the War Secretary said :—(*a*) A memorandum on uniform would be shortly published. Beginning with the Household Troops, the proposed changes would take three to four years to carry out. (*b*) The Committee on battle clasps had recommended 30 for France alone. It was hoped to reduce these to ten, with two or three for other theatres.

Officers Association.—During January, an Officers Association was formed to amalgamate voluntary effort on behalf of demobilized officers and men. Admiral Beatty, Field-Marshal Lord Haig, and Major-General Sir H. Trenchard were Presidents.

Demobilization.—(See Adjutant-General's report, February 23rd). On March 4th, 175,527 officers, 3,959,832 men had been demobilized or discharged unfit. By March 19th, 4,001,174 of all ranks.

On December 31st, 1919, 9,500 firms were on the Roll, employing 1,650,000 men, 86,000 of them disabled ex-service men. 40,000 ex-service men were on the register for employment, many more awaiting discharge from hospital. During the past four months, an average of 15,000 registered, 4,000 had been found employment, 11,000 " gone off for various reasons."

On January 17th, 3,868 ex-officers had been placed, 15,817 of all ranks were registered for employment. The Appointments Board were placing 250-300 of all ranks weekly.

On February 1st, 116,470 men were in Government employ, 76,955 permanently, 39,515 temporarily.

On February 6th, 339,294, or 8 per cent., were drawing out of work donation. At the end of the month, the number was 289,000, 38 per cent. of whom were registered under skilled occupations. On March 25th, the donation was extended till July 31st.

On February 29th, 11,000 firms were on the Roll, employing 1,778,737 men, 92,262 of them disabled ex-service men; 9,560 firms were full up; 1,440 had vacancies for 3,917 disabled men. Disabled men employed had given satisfaction. By March 19th, 14,000 firms were on the Roll.

On March 23rd, 19,514 disabled men were in training, 27,500 awaiting training.

Pensions.—On March 4th, the Pensions Minister said:—Government had approved the majority of 49 recommendations made in the Special Committee's second report. A detailed statement was issued. The cost sanctioned was £1,900,000 of £3,000,000 proposed.

Land Settlement.—On March 11th, in Ireland, 5,730 applications for cottages and plots had been received, over 2,000 acres purchased.

On March 19th, in England and Wales, 194,071 acres had been purchased by County Councils and the Ministry of Agriculture, 17,461 applicants interviewed, 15,474 approved, 5,671 settled. By March 25th, there were 34,000 applicants, 19,400 approved, 5,714 settled. 210,000 acres had been purchased, 110,000 were in occupation.

India.

Waziristan.—During December, 245 air raids were made, 40 tons of bombs dropped. On January 7th, a reconnaissance near Jandola cost 60 casualties. On January 14th, during an advance by the Derajat column north of Anni Panji, eight British officers were killed, one missing, six wounded; six Indian officers killed, six wounded; 33 Sepoys killed, 40 missing, 278 wounded; total 380. The enemy used smokeless powder and low trajectory rifles. On February 14th, the Derajat column occupied Marobi. By the end of March, affairs were quietening.

Casualties.—On February 16th, casualties were returned: (1) in the Afghan operations, since January, 1919, 25 killed, 36 wounded; (2) in Waziristan, 29 killed, 26 wounded; (3) since the Armistice, British Army, 5 officers killed, 11 wounded, 22 men killed, 137 wounded; Indian Army, 49 killed or died, 51 wounded.

Commissions.—On March 15th, five Indian gentlemen were nominated for entrance at Sandhurst.

Afghan Operations, 1919.—The Commander-in-Chief's despatch of November 1st, 1919, was published on March 15th, 1920. 340,000 of all ranks, including followers, 158,000 animals, were employed. The Afghans had 7,000 cavalry, 42,000 infantry, 130 guns, and calculated on the aid of 120,000 tribesmen armed with modern rifles. One frontier militia corps was broken up, there were many desertions from others, and the disbandment of the whole was recommended. Exceptional difficulties were encountered.

Mesopotamia.

During February, 13 units of levies were sanctioned, each composed of Arabs and Kurds, under a British Commandant, the total numbering 67 officers, 6,228 men. Half the force mounted. Two more units were proposed.

Somaliland.

During January, British troops were assembled at Berbera, Italians at Obbia, for operations against the "Mad Mullah." The Royal Air Force contributed 22 officers, 159 men, with 12 aeroplanes, and the operations were placed under its command (see War Secretary's speech, February 23rd). Jidali was bombed on the 21st, and occupied by the Camel Corps on the 26th. On February 4th, the King's African Rifles captured Baran, and, after a pursuit by friendlies, etc., Tule was taken on the 11th. The "Mad Mullah" escaped, but his followers surrendered or were killed.

United States of America.

On February 17th, it was decided to prosecute 179,000 "draft dodgers."

On February 20th, the Military Committee of the House of Representatives approved universal military training. On the 24th it was omitted from the Army Reorganization Bill.

Austria.

On March 18th, the National Assembly passed a Bill providing for 30,000 men, including 1,500 officers, as per Treaty. They were to be organized in six brigades, each province forming an independent recruiting area, and soldiers being placed under civil law for many offences.

Bulgaria.

On March 1st, the 1920 class were warned (in contravention of the Peace terms).

Czecho-Slovakia.

During January, the following force was estimated for: 48 regiments of infantry, 4 of chasseurs, 10 independent battalions, 10 regiments of cavalry, 10 regiments of field, 12 of heavy artillery, 12 howitzer brigades, 5 battalions flying corps, 1,310 aircraft, 1 railway regiment, 5 transport battalions, technical corps, etc. The infantry establishment was given as 3,756 officers, 83,372 men, 4,046 horses; cavalry and artillery, 1,413 officers, 20,012 men, (?) 11,781 horses.

On March 19th, the National Assembly passed a Bill providing for a militia system plus 150,000 Regulars. The term of service was fixed at 24 months for the next 3 years, 18 months for the following 3 years, and 14 months afterwards.

France.

On February 4th, a Bill was introduced recommending:—One year's universal service from January 1st, 1922, at the age of 20. The term "Territorial" to be abolished; all men to be called up for a single army, between the ages 20-45. During the first 9 years, after first year to serve in the First Reserve (i.e., 21 days' annual training); during the next 9 years, to undergo two periods of 13 days' training annually. After 6 months' service, soldiers to be eligible for a Special Officers' Corps. Recruits to be called up in November and February. Special pay and chances of quick promotion on re-engagement. Meanwhile, transitional arrangements empowered.

On February 20th, a private Bill was tabled proposing:—8 months' service at age of 20, 4 annual trainings for 15 days, then men to pass to Reserve, with liability for 3 years on emergency.

Germany.

On February 12th, before the French Foreign Affairs Commission, General Niessel estimated the German Army at:—300-400,000, Reichswehr, 100,000 Safety

Police (ex-soldiers), with heavy and light artillery, flame-throwers, tanks, and aeroplanes, 18 classes of Einwohnerwehr, each 300,000 strong, of men of 18-36. Total, 5-6,000,000. War material factories were camouflaged.

On February 17th, the Supreme Council sanctioned the reduction of the Army (i.e., Reichswehr) to 200,000 by April 10th, 1920, three months after the Peace Treaty's coming into force, and to 100,000 by July 10th, 1920.

On February 18th, the British War Secretary said:—The Landwehr was demobilized early in 1919. The Reichswehr, including demobilization staffs of war-time army and men from the Baltic, numbered 300-350,000, in process of reduction to 200,000 by April 10th, 1920. The armed Safety Police were to have an establishment of 70,000, the naval land force of 12,000. There were 450-600,000 Reserves (Einwohnerwehr) under the Ministry of the Interior, not uniformed or armed. The question of their disbandment was before the Supreme Council. Aeroplanes were prohibited by the Peace Treaty.

During the *coup d'état* of March 19th, and following days, the troops lately in the Baltic States and two naval brigades took a prominent part. The former comprised the Iron Division, which numbered 11 battalions and 3 detachments infantry, 5 squadrons cavalry, 13 batteries field artillery, 5 units engineers, 427 aircraft, wireless and telephone detachments, armoured car and tank sections, 15 supply units, etc. It was reported that, where nominally demobilized, men had been distributed amongst rural estates, kept their arms, and were paid 11 marks daily; their officers remained close at hand, generally where machine-guns were packed ready. The civil organization was similarly camouflaged. The Inter-Allied Commission found 3,500 3-in. field guns near Berlin, or, altogether 12,000 guns, 6,000 aircraft intact. Thirty clauses of the Treaty had been disregarded. The Sparticists in the Ruhr Valley were credited with over 30,000 men, 12,000 guns.

Hungary.

In August, 1919, men of 25-35 were called up; in December all over 25 released, those of 21-25 retained. The term of service was to be two months, the strength as laid down in the Treaty.

In Rumania and Serbia demobilization was ordered during March.

Turkey.

During March, 40,000 Turkish irregulars were reported in Asia Minor; the French had 20,000 men; the Greeks six divisions of 15,000 men, 200 guns, with a 7th division in reserve. On March 16th Allied troops occupied Constantinople.

Russia.

January.—The Bolshevist strength was estimated at 1,200,000. Between December 21st—January 9th, the Bolshevists claimed 25,400 prisoners, 650 guns, etc., on the south front. On the north front there was no alteration. On the north-west and west front, the Pole-Lett advance was successful. The Poles occupied Prozkuroff, Jitomir, Dubny, etc., and the Letts regained nearly all their territory. The Poles anticipated a Bolshevist attack in March. They estimated as available for it over 800,000 men, including Siberian regiments (one now opposite Bobruisk) and 10,000 recently enlisted Chinese. The Poles had 700,000 men, badly equipped. A German estimate of the armies of the Baltic States gave a total of 100,000 men, half efficient, wanting training and artillery. They comprised 40,000 Lithuanians, improving under British organization; 30,000 Letts (three divisions, plus 6,000 Landwehr), recruits aged 19-24 being called up; 35,000 Esthonians (three divisions), plus remnants of Russian north-west armies. Unless supported

by the Entente Powers, in German opinion, they would be unable to withstand Bolshevist attack. On the south and south-west front, the Bolshevist advance reached the Manitch and threatened Odessa. The Russian retreat was steady, but immense stores were lost. On the east front, revolutions at Irkutsk, on the Ussuri, and elsewhere, caused the collapse of Admiral Koltchak's Government and the dispersion of his forces. The Admiral reached Irkutsk on the 14th and was surrendered by the Czechs. West of Irkutsk there were still 15,000 Czecho-Slovaks, 4,000 Rumanians, and 1,000 Yugo-Slavs. 35,000 Japanese held the railway eastwards from Irkutsk. 7,000 Americans on the Ussuri were under orders to evacuate by March. The Japanese declared that, whilst refraining from interference in internal politics, they would hold the railways at least until the Czecho-Slovaks, etc., were evacuated. In Trans-Caspia, the Bolshevists were strongly reinforced. Many Germans and 37,000 Magyar prisoners were reported to have been enlisted. A detachment was sent to Khiva, and emissaries to Herat. Trains were running from Bokhara to Karshi (90 miles south-east); from Karshi to Termez (on the Afghan frontier) the line was dismantled. On the north-west front, the Esthonians and Letts concluded armistices with the Bolshevists.

February.—A mutiny on the Archangel front, and revolutions at Archangel and Murmansk led to the collapse of resistance. On the west front engagements between Rumanians and Bolshevist patrols were reported on the Dniester. A Polish-Rumanian understanding was arrived at. On the south front, the Bolshevist drive continued, though several reverses were recorded. Odessa, Rostoff, and Stavropol were successively lost. The proposed British evacuation of Batum was cancelled. On the east front, fighting practically ceased. Admiral Koltchak and his Prime Minister were shot by the Reds at Irkutsk on the 7th. The British and American Governments were shipping the Czecho-Slovaks to Europe as transport permitted. The Japanese maintained a neutral attitude. 30,000 Chinese troops were in the railway zone: one brigade east of the railway, one at Nikolsk Ussurisk, one at Heilungkiang (North Manchuria).

March.—Four hundred survivors of the Russian troops in the north reached Lentiera (130 miles north of Viborg) on the 9th and were interned. A Lett-Esthonian demarcation of frontier was agreed upon. A Bolshevist counter-attack on the Poles was opened on the 19th, with the Twelfth, and parts of the Fourteenth and Sixteenth, Armies, totalling 50,000 men. The Sixteenth Army operated on the Pripet, the Fourteenth from the Ukraine to the Rumanian frontier. The Poles repulsed the movement. The Poles contracted with America for equipments, etc., for 200,000 men, and surplus stock. Two divisions of released Ukrainian prisoners were being formed for General Petlura in Poland and Rumania. His troops occupied part of the right bank of the Dniester, in contact with the Poles on their left. On the south front, the Bolshevists entered Novo Rossisk on the 27th. General Denikin and the remains of the Volunteer Army were conveyed to Theodosia. On the 31st, part of the Don Army still held Tuapse (south of Novo Rossisk). In Siberia, 20,000 Czechs had been repatriated. The Japanese were evacuating the Amur railway and retiring on Chita, with a brigade at Manchuria station.

PRINCIPAL ADDITIONS TO LIBRARY.

February—March—April, 1920.

MONS, ANZAC AND KUT. By an M.P. 8vo. 14s. (Edward Arnold). London. 1919.

THE ECONOMIC CONSEQUENCES OF THE PEACE. By John Maynard Keynes, C.B. 8vo. 8s. 6d. (Macmillan). London, 1920.

TREATY OF PEACE WITH GERMANY . . . AND TREATY BETWEEN FRANCE AND GREAT BRITAIN . . . SIGNED AT VERSAILLES, JUNE 28, 1919. Maps. fo. 21s. (H.M. Stationery Office). London, 1919.

TANKS, 1914—1918. THE LOG-BOOK OF A PIONEER. By Lt.-Col. Sir Albert G. Stern, K.B.E., C.M.G. Illustrations. 8vo. 12s. (Hodder & Stoughton). London, 1919.

G.H.Q. (MONTREUIL-SUR-MER). By "G.S.O." Map and Illustrations. 8vo. 20s. (Philip Allan & Co.). London, 1920.

ELEMENTI DI NAVIGAZIONE ASTRONOMICA. LIBRO DI TESTO PER LA R. ACCADEMIA NAVALE. By Capt. Luigi Tonta. Diagrams. 8vo. Leghorn, 1919.

THE TANK CORPS. By Major Clough Williams-Ellis, M.C., and A. Williams-Ellis. Illustrations and Map. 8vo. 10s. 6d. (Country Life, Ltd.). London, 1919.

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THE SOLUTION OF TACTICAL PROBLEMS. A logical and easy way of working out the Tactical Schemes set at Examinations. By Lieut.-Col. J. Layland Needham, *p.s.c.* 11th ed. Diagrams. 8vo. London, 1916.

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IMPRESSIONS OF ATHENS, FEBRUARY 1st—10th, 1918.

REVUE MILITAIRE GENERAL.

This important monthly recommenced publication last September. In a short preface the Editor points out that 1870-1 was the result of a failure to study things military and lack of a military literature; the victory of 1918 was due to the better instruction of the Army particularly by such educators as Generals Lewal, Philibert, Maillard, Lanrezac, de La Croix (the late Editor of the Magazine), Langlois, Foch, Bonnal, and Pétain. In order that military experience may not be lost, the pages of the *Revue* will be open to all combatants who have anything interesting to say. The price is 3 francs a number.

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THE GUARDING OF THE EAST: TANNENBERG.
RUSSIA'S COLLAPSE AND THE POLITICAL FORMS OF THE MOMENT.
A CONTRIBUTION TO THE HISTORY OF THE BATTLE OF THE MARNE.
OFFICER AND PRIVATE.
THE WAR ON THE WEST FRONT (from the *Revue de Paris*).
REVIEW OF LITERATURE.

CORRESPONDENCE.

"The European Brigade under Sir Archibald Alison in the Ashanti War, 1873-4."

To The Editor of the Royal United Service Institution Journal.

Dear Sir,—With respect to the Paper by me under the above title, in the Journal of the R.U.S. Institution for February, 1919—page 31, first seven lines—giving names of those submitted by Col. McLeod, C.B., for the Victoria Cross, and mentioning that under the then Statutes of the Order it was awarded only to Sergt. McGaw. (See Brackenburg's Narrative of the Campaign, Vol. II., p. 225-6.) I ought, perhaps, to add, bearing, as it does, upon the bravery of others not included in the above names, that I have since been made aware that it is entered in the Regimental Diary of the 2nd Battalion, Rifle Brigade, kept during the Campaign, that Lieut.-Colonel Warren had also recommended the three following of this Battalion for the V.C.:

Lieut. and Adjutant R. F. Meysey-Thompson,
Sergeant-Cook Armstrong,
Pte. Taylor.

I find no entry of the recommendation in Brigade office letters, and it was doubtless settled without such entry.—No V.C. was awarded, but subsequently Sergt.-Cook Armstrong, and Pte. Taylor received the Distinguished Service Medal.

The only officer who was awarded the Victoria Cross for the Campaign, as far as I am aware, was Lord Gifford, Commanding the Scouts.—Yours faithfully,

C. W. ROBINSON.

April 7th, 1920.

NOTICES OF BOOKS.

The Official History of the War: Naval Operations. By Sir Julian S. Corbett. Vol. I.; with case of maps. Longmans.

Not unnaturally the issue of the first volume of the official history has been eagerly looked for. Those who had read carefully every published account realized how much remained for explanation; while those who were familiar with Sir Julian Corbett's historical writings wondered how he would adapt himself to so novel a task. The volume now published sets these doubts at rest. The narrative is full, and the exposition lucid: when the work is completed it will have made available a mass of material adequate for all but severely professional purposes. The manner, it is true, differs considerably from that which we have learnt to expect from the author. Sir Julian Corbett has hitherto shown himself a picturesque writer, with a well marked tendency to hero worship. The present work, though easily read, is severely purposeful in style, and hero-worship very rightly finds no place in it.

The book is written from the Admiralty records, with very little quotation, and entirely without citing of references. This was inevitable, for the book is designed for the general public, to which references to inaccessible documents would be entirely meaningless. But this course, though necessarily adopted, is not entirely satisfactory; it gives a good interim history, it is true, but still leaves us with the recollection that we cannot yet be told all, and that the final account will not be written till that distant date when the records can be thrown open.

There are always those to whom an official history is suspect. The official historian, they say, chooses his documents with one eye on the office whose work he is describing. Such an objection is, by its nature, difficult to meet: perhaps the best answer would be to point to the "Transactions at Sea," written 200 years ago by the then Secretary to the Admiralty, and therefore clearly coming within the category of an official history. Burchett was well-informed as to matters that had passed through his own office, but he wrote less fully, and less frankly, than Sir Julian Corbett; yet his history still holds the field, no one having thought it necessary, in the interests of historical completeness, to re-write it from the records. Clearly, therefore, an official history serves a very good purpose, and as Sir Julian Corbett's promises, to judge by this first instalment, to be an excellent book of its kind, a useful life may easily be predicted for it.

In reading the narrative, and especially Sir Julian Corbett's occasional comments on the nature of naval war, it is desirable to bear in mind the statement printed opposite the title page, that "the Lords Commissioners of the Admiralty . . . . . are in no way responsible for his reading or presentation of the facts as stated." Sir Julian says that "of recent years, by a strange misreading of history, an idea had grown up that its (the Grand Fleet's) primary function is to seek out and destroy the enemy's main fleet." The comment is Sir Julian's own, and it is sincerely to be hoped that the Lords Commissioners of the Admiralty not only do not endorse it but entirely reject it. To destroy the enemy's main fleet is, and always has been, the primary, the only primary,

function of the Royal Navy; and, until that is done, all else that it may undertake is secondary and conditional.

But although the author's doctrine may be unacceptable, this is not to say that his presentation of facts is vitiated thereby. He has been successful in making plain the course of extraordinarily detailed and complicated operations, many of which, except in the barest outline, were hitherto undisclosed. If, for instance, the public could have known at the time of the kaleidoscopic changes and unceasing alertness enforced upon the Navy by the fact that one small enemy squadron, and a few single cruisers, were at large in the seven seas; if it could have been given any indication of the importance of the work done on the Belgian coast by Admiral Hood's miscellaneous force, in co-operation with the Army, when the German rush for the Channel ports was stayed; even if it could have known and appreciated the magnitude, in terms of sheer hard labour, of the task which devolved upon the Fleet when the decision was taken to shift the Army base to St. Nazaire; if these and other similar activities could have been revealed, there would assuredly have been none of the foolish and querulous complaints that the Navy was not doing its share. Most of the things that the Navy did in this war it has, amid different surroundings, done before. There was no new principle involved in the co-operation on the Belgian coast; nor in the change of base; nor in the Colonial expeditions to New Guinea, to the Cameroons and other parts of the world. There was assuredly nothing new in the flotilla and squadronal actions which took place. But the application of old principles to new and altered circumstances was a task of such complexity and difficulty as probably was never set before. This was notably so in the chase after the German commerce raiders in distant seas. The net spread for them was necessarily wide meshed, but it was world wide; and never before, with more primitive methods of communication, could so vast a net be spread. The enemy slipped through the meshes in several places, but from the first it was a moral certainty that all his ships must be caught. The only real question was as to how much damage he would succeed in doing before being caught. Whether he might have done more with the ships available is perhaps disputable; but it is not disputable that he might have done far more than he did with his High Seas Fleet. The lack of enterprise on the part of the German High Command, for instance, at the time of the first battle of Ypres, contrasts most unfavourably with the initiative and achievements of the best of the enemy commanders abroad.

This volume ends with the battle of the Falklands; as to which, and the other squadronal actions described, it is only necessary to say that Sir Julian Corbett has given so adequate a presentment of the facts as to enable the reader to form an opinion of his own.

Life of Lord Kitchener. By Sir George Arthur: Macmillan & Co., Ltd.

This book of three volumes seems to combine many of the qualities which go to the making up of a truly satisfying biography. The author is at no pains to persistently invite our attention to all that his hero did and said and thought; instead, he tells us in simple language, with a wholly admirable restraint, and with a due sense of proper proportion, all that, during a very full life, Lord Kitchener achieved, and he leaves us to form our own opinion of the great Englishman and great soldier. The majority of those who have been eagerly awaiting the publication of this book, will no doubt turn most readily to the third volume, for the reason that it deals with the tremendous events with

which we have all been so intimately concerned, and from the consequences of which we shall not for some time to come be able to detach ourselves; but in so doing they will be ill-advised. The earlier volumes, which treat of Lord Kitchener's younger days, of his service in Palestine, in Egypt and in South Africa, are equally appealing, and tell us of his apprenticeship to the great work to which the last years of his life were devoted. We learn from these two first volumes how thorough was Lord Kitchener in all matters; how strong was his sense of duty; that in every public office he held, whether as subordinate or head, he always did good work, never sparing himself, getting the best out of his instruments, and, above all, considering the cost, whether his paymaster was a group of private individuals like those who administered the Palestine Exploration Fund, the Government of Tewfik Pasha, or the British Empire.

In the execution of all that he undertook Lord Kitchener never appears to have regarded only the needs of the moment, he always took the long view, he invariably studied the influence which passing events might possibly exercise upon the future; and he had so trained himself to the cultivation of a wide perspective in all matters, that when the Great War came upon us, he, almost alone amongst the soldiers and statesmen of Europe of those days, realized that we were entering upon a war of abnormal length, one which would make upon us huge and ceaseless and ever-increasing demands, and, so far as was humanly possible, Lord Kitchener at once set about to prepare to meet them. His life, spent among Orientals, does not strike us as one that should have taught him much about German mentality, while not many soldiers in August, 1914, would have accepted Kitchener's opinion of the German plan of campaign; but service on the Zanzibar Delimitation Commission had shown him how unscrupulous was Germany in the prosecution of her aims, that to these she had set no limit; while Kitchener had formed a truer conception than had some of the French and English military experts as to the probable effect of the German penetration of Belgium on our place of concentration.

From the above it must not be accepted that this book contains anything really controversial; it makes, indeed, little or no contribution to such controversies about points of history connected with the war as have unhappily arisen; no one who reads this life can imagine Kitchener entering into such matters had he lived, and his biographer has exercised a wise discretion in the avoidance of anything that savours of controversy. Only here and there is a letter published or a conversation recorded which lets in a welcome light upon matters which have been misrepresented or which are obscure.

Lord Kitchener had few intimates, and his circle of acquaintances was narrower than that of most public men; and the legend that described him as a shy, morose man, unbending, somewhat ruthless, hard and unsympathetic had found general acceptance. The wonder is that, while so many believed it, his name had become one to conjure with, that all men—not of our race alone—believed in and trusted him, that there was a universal feeling of relief when we learnt that he had become Secretary of State for War, that there was a general cry of consternation when the news of his death reached us. Sir George Arthur shows us another side of his hero's character, one which was rarely disclosed, and we know him better than we did before, and, perhaps, if possible, we shall now appreciate him more.

In the foreword contributed to this "Life" by the great soldier who led the armies which Kitchener fashioned, a fine tribute is paid him; it is said that "he created the means of winning the war," that perhaps the victory would have come sooner had he been with us to the end. May it not be added that we have felt his loss at least as much when it came to the making of peace?

The German Account of the Battle of Mons.

Der grosse Krieg in Einzeldarstellungen: Heft 6. Die Schlacht bei Mons. Written from official sources by Hauptmann Freiherr von Gleichen-Russwarne and Hauptmann Ernst Zurborn. Published at the request of the German General Staff by Gerhard Stalling, Oldenburg, 1919. Price M2.40.

During the past few weeks two publications have appeared in Germany dealing with the operations in August and September, 1914, which are of the greatest interest from the British point of view. General von Bülow's "Mein Bericht zur Marneschlacht" gives the daily operation orders for the German Second Army during the whole of that period of open fighting, and offers a clear insight into the strategic intentions of the commanders of the German First and Second Armies: the second, "Die Schlact bei Mons," is a carefully-written tactical study, giving a full account of the battle movements of the German First Army during the 23rd and 24th August on the front Condé—east of Mons.

The Battle of Mons was essentially a battle of encounter, and must be regarded as the unpremeditated extension of the Battle of Charleroi, which von Bülow had planned against the French forces reported south of the Sambre. His Second Army was to attack south, across the Sambre, and von Hausen's Third Army was to co-operate by attacking west, across the Meuse, towards Mettet, sending a strong force over the Meuse by Dinant towards Rocroi, to bar the French line of retreat. The German First Army, under General von Kluck, who was temporarily subordinated to General von Bülow, was, according to the latter's operation orders for the 23rd, merely "to conform to this offensive movement."[1] Fortunately the attempt of the Third Army to get astride the French line of retreat, which was clearly full of disastrous possibilities, both for the French Fifth Army and the British Army, was an utter failure, and during the day the centre of gravity of the Battle of Charleroi gradually moved westwards from Charleroi to and west of Mons as the advanced guards of the corps of the First Army came up against the British position on the Mons—Condé Canal.

The monograph under review gives the clearest evidence of the suddenness of the Battle of Mons and it is indeed still somewhat mysterious how, even in 1914, two armies could come within a few hours' march of one another and still be comparatively ignorant of each other's presence. Kluck's operation orders for the 23rd, written on the evening of the 22nd, ordered the advance to be continued, giving the occupation of the high ground, south of the Mons—Condé Canal, as the day's objective for the First Army: apart from a squadron of British cavalry, encountered five miles north-east of Mons, and the presence of a British aeroplane, nothing was known of the whereabouts of the British Expeditionary Force.

On the morning of the 23rd the fog of war still hung heavily about First Army Headquarters. Detrainments on a large scale were reported about Lille and Tournai during the 22nd, and this it was imagined referred to British troops. Fresh orders were issued, therefore, at the eleventh hour holding up the advance preparatory to a wheel westwards to face towards Lille. Not until the leading troops of Kluck's inner corps were actually in touch with the British outposts in front of Mons was it finally decided to keep to the orders of the previous evening and advance across the canal. This little incident is typical of von Kluck's lack of determination, and his inability to decide on any plan of action and carry it through; his plans seem to alter from day to day with every passing report.

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[1] Bülow's "Mein Bericht zur Marneschlacht," p. 21.

From a tactical point of view one of the most striking features of the book is the admirable co-operation between the infantry and artillery, a subject which must have received as much attention before the war in the German Army as in our own. The attack on every crossing and of practically every battalion received special artillery support close up to the firing line. For instance, in the attack on the Mariette crossing by the 9th German Infantry Brigade at about 4 p.m. in the afternoon, one of the battalions "was unable to get forward. The battalion commander, therefore, sent word to the 18th Field Artillery Regiment and asked for two guns. A section from No. I. Battery was sent forward and opened fire . . . . the battalion was then ordered to assault . . . . this attack was again held up by the enemy's rifle fire. The gunners and infantrymen then manhandled the guns further forward. Shell after shell was fired at point-blank range against the loopholed buildings . . . ." and so on. In a similar way the artillery played a vital part in all the isolated attacks along the canal.

The operations of every German battalion engaged are vividly described, and, generally speaking, with accuracy, in so far as they agree with the movements and accounts of those of our own battalions concerned. There are some minor errors, however, such as the statement that the "1st and 2nd companies of the 52nd Regiment (10th German Infantry Brigade) took the railway bridge south of La Hamaide by storm at 8.30 p.m., singing "Deutschland, Deutschland über alles." When the British troops holding this bridge left the canal at about 9 p.m. and retired back along the railway embankment no attack had been made on the bridge in question, and the machine-gun on the railway itself covering the bridge, until the retirement was completed, did not come into action. Just before leaving, the British were amazed to hear German voices singing just across the canal and a heavy rifle fire was promptly opened both to join in the concert and cover the commencement of the retreat. The singing then ceased and no further German movement was noticed.

To reconcile the two accounts we may conclude that the singing gave the British notice of the presence of a German concentration and thus warned they dealt with it before the attack materialized.

In the concluding chapter of the book the usual heroics appear about the "victory" of Mons. It is clear, however, from the German evidence now available that the British Army was fortunate to escape its formidable opponent as easily as it did. The battle was not fought on any plan and simply resulted in pushing back the enemy with the brute force of greatly superior numbers. As a fact the French Fifth Army and the British Army were in an extremely critical situation on the 22nd and 23rd of August, and had von Bülow's original plan of a combined operation by the German First, Second and Third Armies been carried out with more determination, especially on the part of the Third Army, the victory of Mons might indeed have been worthy of the name.

Actually, as the maps show, three-and-a-half German divisions attacked the British 3rd Division, and two-and-a-half the 5th Division, but, thanks to British stubbornness and good shooting, accomplished nothing except some gain of ground in the Mons salient at the cost of an enormous casualty list.

This fifth volume of the "Einzeldarstellungen" is a most valuable contribution to the history of the Battle of Mons; the sketch-maps are excellent, showing the attacks in detail and the lines of advance of each division up to Le Cateau, and both they and the orders of battle given in the text, provided it is known that "J.R." means Infantry Regiment and not Jäger Regiment, are comprehensible even to those ignorant of German.

Tanks in the Great War. By Colonel J. F. C. Fuller, D.S.O., Chief G.S.O., Tank Corps, in 1917 and 1918: John Murray.

It is always refreshing to come across a book written by an enthusiast, and so one welcomes with both hands this book. An enthusiast who must have seen with his own eyes every detail, small and great, of the development of the latest incarnation of the knight in armour, and who had all through no small part in every phase of the creation of a wonderful arm—this is the man whose story is likely to be of the best, and we find it so. This does not mean we are prepared to go so far as our author in our expectations of the future rôle of tanks in war, and we think that his hope of an enormous saving in combatant personnel outside of the tanks is exaggerated. But we hail his account of what Behemoth did do in France and Belgium and Palestine, and we cannot doubt that all officers who aspire to commands in future war must know what tanks have done and what still better ones are likely to be able to do. They can gain a solid foundation for their knowledge in this book, which John Murray gives out to the world.

There are some things of very great interest to all soldiers, interspersed with short chapters that only mechanical engineers can hope to digest, but this is inevitable in a first authoritative book that is expected to cover lightly all the ground. Among the points of general interest are the periodical attempts to put down on paper a tactical doctrine for the Tank Corps, the first of these being Colonel Swinton's "Note on Tank Tactics," page 50.

The Corps had its baptism of fire on the Somme, after the battle of 1916 had been going on for exactly eleven weeks, and it speaks volumes for the persistence and confidence of the tankers that the arm continued to function. "This attack on September 15th, from the tank point of view, was not a great success. Of the 49 employed, only 32 reached their starting points; nine pushed ahead of the infantry . . . and nine . . . did good work in clearing up points. Of the remaining 14, nine broke down from mechanical trouble, and five became ditched." A tactical note says, "on account of the secrecy it was necessary to maintain, commanders had little or no conception of the tactics." In all the tank work before the Cambrai venture, the new arm was hampered in particular by the terrible state of the ground after the usual bombardment. On that occasion the tanks were really to lead, our guns attending chiefly to the German artillery. The result was excellent timing of the tanks, as Colonel Fuller shows, but he leaves in doubt the question of whether Byng or the tank people are to be credited with the new tactical venture.

The general conclusions of this book should be studied not only by all fighting soldiers, but by all who have any part in influencing war preparation.

Elementi di Navigazione Astronomica. By Luigi Tonta: Capitano di Fregata, R. Giusti, Livorno.

The book is intended in the first instance to serve as a text book in Nautical Astronomy at the Italian Royal Naval Academy, a work which the author's period of service from 1911 to 1917 as professor of navigation in that institution well qualifies him to undertake. But it represents a good deal more than this. As the author says in a foreword, "The book contains not only the usual matter treated in the customary manner, but every branch of the subject is dealt with

in a novel fashion, and every chapter contains something that is original, with footnotes of interest, such as are not usually to be found in similar publications." The claim here set forth is fully justified. Captain Tonta has taken infinite pains to collect, and present in a readable form, such new notions worthy of notice as have been put forward during the last quarter of a century, not only in his own country, but in Great Britain and America, in France and Brazil. The book represents a vast amount of research on the part of the author, and presenting as it does a picture of the position of nautical science at the beginning of the twentieth century should have considerable historical value in the future.

The Journal

OF THE

Royal United Service Institution.

VOL. LXIV. 1919-1920.

APPENDIX.

THE EIGHTY-NINTH ANNIVERSARY MEETING.

MARCH 2nd, 1920.

Royal United Service Institution.

THE EIGHTY-NINTH ANNIVERSARY MEETING WAS HELD ON TUESDAY, MARCH 2nd, 1920.

ADMIRAL SIR F. C. D. STURDEE, BART., K.C.B., K.C.M.G., C.V.O.
(Chairman of the Council), presiding.

THE CHAIRMAN: Gentlemen, I will ask the Secretary to read the Notice convening the Meeting.

THE SECRETARY (Lieut.-Col. SIR ARTHUR LEETHAM, C.M.G.), read the notice.

ANNUAL REPORT FOR 1919.

The Council regret to have to report the death of Colonel the Right Honourable Sir J. H. A. Macdonald, G.C.B., V.D., the representative of the Territorial Force Major-General the Right Honourable the Earl of Scarborough, K.C.B., T.D., A.D.C., Yorkshire Dragoons, Director-General of the Territorial and Volunteer Forces, and Chairman of the West Riding of York Territorial Force Association, who was elected a Vice-President to fill that vacancy.

The Council also regret to have to report the death of Field-Marshal Sir H. E. Wood, V.C., G.C.B., G.C.M.G.

Council.

Commodore H. E. P. Sinclair, C.B., Director of Naval Intelligence, has been appointed a Member of the Council, as the Official Representative of the Admiralty

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THE SECRETARY (LIEUT.-COL. SIR ARTHUR LEETHAM, C.M.G.), read the notice.

ANNUAL REPORT FOR 1919.

VICE-PRESIDENTS.

Field-Marshal Ferdinand Foch, G.C.B., O.M., was elected a Vice-President on account of his distinguished services as the Generalissimo of the Allied Armies.

The Council regret to have to report the death of Colonel the Right Honourable Sir J. H. A. Macdonald, G.C.B., V.D., the representative of the Territorial Force; Major-General the Right Honourable the Earl of Scarborough, K.C.B., T.D., A.D.C., Yorkshire Dragoons, Director-General of the Territorial and Volunteer Forces, and Chairman of the West Riding of York Territorial Force Association, was elected a Vice-President to fill that vacancy.

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COUNCIL.

Commodore H. E. P. Sinclair, C.B., Director of Naval Intelligence, has been appointed a Member of the Council, as the Official Representative of the Admiralty.

Air-Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., was elected to represent the Royal Air Force, vice Captain H. D. Briggs, C.M.G., R.N., who has reverted to the Royal Navy, but retains his seat on the Council as a Naval Representative.

The following Members of the Council retire having completed three years' service, viz. :—

Admiral Sir F. C. D. Sturdee, Bart., K.C.B., K.C.M.G., C.V.O.
Vice-Admiral Sir A. C. Leveson, K.C.B.
Admiral W. F. S. Mann.
Captain H. W. Richmond, R.N.
Field-Marshal Sir H. H. Wilson, Bart., G.C.B., D.S.O.
Lieut.-General H. D. Hutchinson, C.S.I.
Lieut.-General Sir A. E. Codrington, K.C.V.O., C.B.
Colonel Sir E. W. D. Ward, Bart., G.B.E., K.C.B., K.C.V.O.
Colonel C. H. Colvin, C.B., D.S.O.
Lieut.-Colonel R. Shoolbred, C.M.G.
Lieut.-Colonel A. St. L. Glyn (Resigned).

The following are the names of the Candidates nominated for the vacancies :—

Royal Navy (1 Vacancy).

Admiral Sir F. C. D. Sturdee, Bart., K.C.B., K.C.M.G., C.V.O.
Captain H. W. Richmond, R.N.

Regular Army (4 Vacancies).

Field-Marshal Sir H. H. Wilson, Bart., G.C.B., D.S.O.
Lieut.-General Sir Ivor Maxse, K.C.B., C.V.O., D.S.O.
Lieut.-General Sir A. E. Codrington, K.C.V.O., C.B.
Major-General W. H. Anderson, C.B. (Commandant, Staff College).
Major-General Sir L. C. Jackson, K.B.E., C.B., C.M.G.
Major-General Sir V. A. Couper, K.C.B.

Special Reserve (1 Vacancy).

Colonel C. H. Colvin, C.B., D.S.O.

Territorial Force (2 Vacancies).

Lieut.-Colonel R. Shoolbred, C.M.G., T.D.
Colonel B. C. Green, C.M.G., T.D. (London Scottish).

Membership.

The Council beg to report that during the past year 501 Officers joined the Institution (against 303 in 1918). There were 171 withdrawals and 125 deaths (of which 39 were Life Members), making an increase of 205 on the year. The temporary suspension of the Entrance Fee, and the reduction in the amount for Life Membership was discontinued at the end of 1919; the Council trust that Members will do their utmost to introduce new Members during the coming year.

The Council have pleasure in reporting that the Roll of Honour, which contains some 600 names of Officers who were Members of the Institution and who were killed, or died of their wounds, since the commencement of the war, has been completed and is now placed on exhibition in the entrance hall.

The details of Members joining were as follows:—

Regular Army	254
Royal Navy	82
Royal Air Force	52
Territorial Force (including Yeomanry)	45
Royal Marines	19
Special Reserve	17
Colonial Forces	12
Royal Naval Reserve	9
Royal Naval Volunteer Reserve	9
Cadet Battalions	1
War Office (Civil) Staff	1
Total	501

The total number of Members on December 31st, 1919, was 5,160.

Re-opening of the Institution.

The Council have to report that the Institution Building was re-opened for the use of Members on October 1st. The building, both inside and out, was entirely repainted and redecorated.

Finance.

It will be seen from the Accounts that the year's working has given a balance credit of £1,010 8s. 3d.

The Council have pleasure in reporting that they have invested a further £2,000 in the 5 per cent. War Loan (1929-47); this makes the sum of £14,125 16s. 10d. which has been invested during the War.

The invested funds now amount to £22,736 9s. 3d,, which is the value of these investments at their market price in the Stock Exchange Official Price List of December 31st, 1919.

There is a sum due to His Majesty's Office of Works for the painting of the building outside and for the redecoration of the rooms which were not occupied by the Government of which the account has not been presented; otherwise there are no outstanding liabilities.

MUSEUM.

During the past year there have been added 334 new Exhibits, all of which have been catalogued and duly recorded in the JOURNAL, and placed on exhibition in the Museum. These include a number of Exhibits from the War, and the Council desire to express their thanks to the several Donors for these valuable additions.

An oil painting of the late Field-Marshal Earl Roberts, V.C., K.G., etc., mounted on his Arab charger, painted by Captain Adrian Jones, M.V.O., in 1914, was purchased; and attention is called to the interesting oil painting of King Charles I., after Vandyke, which has been placed at the side of the window in front of which the King was executed.

The total number of persons who passed through the turnstile amounted to 78,470, against 67,079 in 1918. This includes a very large number of Soldiers, Sailors, Boy Scouts, etc., who were granted free admission. This total does not include a very considerable number of Visitors who were introduced by Members personally. The total amount taken at the turnstile was £1,056 6s. 0d., against £575 1s. 9d. in 1918.

During the year 38 Schools were granted free admission to the Museum, and attendants were especially detailed to conduct these visitors and explain the principal Exhibits. The amount standing to the credit of the Museum Purchase Fund is £17 9s. 0d., and the Museum Committee hope that this Fund will continue to receive support from the Members of the Institution, especially those who are interested in the Museum.

The sales of the Museum Catalogue and Pamphlets amounted to £310 18s. 8d., which must be considered as highly satisfactory.

LIBRARY.

Mr. A. D. L. Cary has been continued in his office as Librarian for a further year.

The Library Committee intend selecting a retired Officer, who must be a Member of the Institution, with a view to his being appointed Librarian, but for some period he will be under the instruction of Mr. Cary, who is a most experienced Librarian.

The number of books added to the Library during the past year was 222, bringing the total number of volumes up to 32,824.

The number of Members subscribing to the Lending Library during the past year was 209 as against 123 in the previous year. The number of books issued on loan to Members was 1,504, as against 911 last year.

The Library Committee hope that as the War is now practically over the number of subscribers to the Lending Library will resume its pre-war conditions.

Donations of books, etc. have been received from our own and various foreign Governments, as well as from private individuals, and the thanks of the Council have been conveyed for these donations.

JOURNAL.

The Quarterly publication of the JOURNAL has been continued up to date, and a commencement has been made, so far as the great increase in printing expenses allows, in adding to the number of pages of the JOURNAL. During the War it was found necessary to reduce the number of pages from 320 to 176; it is hoped in the next issues to bring the number of pages up to about 256.

The present time not being propitious to entering into an entirely new printing contract, a temporary one to cover the four issues of the JOURNAL for 1920 has been made with Messrs. Keliher & Co., Limited, the present printers.

The thanks of the Institution are due to the following writers for papers contributed by them :—Dudley Baxter, Esq., M.A.; Brevet Lieut.-Colonel R. H. Beadon, R.A.S.C.: Major A. F. Becke, late R.A.; Major-General W. D. Bird, C.B., C.M.G., D.S.O.; Captain F. Bowen; "Captivus"; Major T. E. Compton; Lieutenant C. M. Faure, R.N.; Colonel C. Field; F. W.; Captain S. C. S. Goldingham, R.M.L.I.; Captain F. C. Goodwin; Captain B. H. L. Hart, K.O.Y.L.I.; Lieut.-Colonel C. G. Higgins, C.M.G., D.S.O.; Captain H. M. Johnstone; Lieutenant W. S. King-Hall, R.N.; Lieut.-Colonel Sir A. Leetham, C.M.G.; Dr. T. M. Maguire, LL.D.; the late Major W. Meyer-Griffith; Lieut.-Colonel C. C. R. Murphy, I.A.; "Q.L."; Captain H. W. Richmond, R.N.; Major-General C. W. Robinson, C.B.; Lieut.-Colonel G. N. Stephen, R.A.M.C.; Lieut.-Colonel C. H. Straton; Commander Lord Teignmouth; Lieut.-General F. H. Tyrrell; Brigadier-General A. G. Wauchope, C.M.G.; Lieut.-Colonel W. H. F. Weber, C.M.G., D.S.O., R.F.A.

Papers on the following subjects were read and discussed and have appeared in the JOURNAL. To the authors are due the best thanks of the Institution :—Captain C. di Villarey, Royal Italian Navy, "The Work of the Italian Navy in the Adriatic during the War." Lord Eustace Percy, "The League of Nations."

Brevet Lieut.-Colonel M. F. McTaggart, D.S.O., 5th Lancers, "Notes on Instruction in Equitation," David Ogg, Esq. (late Lieutenant R.N.R., "German Naval Propaganda." Major-General Sir George Aston, K.C.B. "Combined Operations." Air Commodore H. R. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., "The Air Force." Major-General Sir Louis Jackson, K.B.E., C.B., C.M.G., "Possibilities of the Next War."

The exchange of the JOURNAL with Foreign Governments, and with many Societies in this and other countries, has been continued so far as this has been possible.

The outside sales of the JOURNAL, i.e., to others than Members of the Royal United Service Institution, has been satisfactory.

A. LEETHAM, Lieut.-Colonel,
Secretary and
Chief Executive Officer.

February 3rd, 1920.

DR. REVENUE ACCOUNT FOR THE YEAR ENDING 31ST DECEMBER, 1919. CR.

1918. £ s. d.		£ s. d.	£ s. d.
1,369 3 5	To Journal Printing	...2,395 11 8	
198 14 9	,, Postage	... 235 11 6	
178 3 0	,, Literary Services	... 172 19 9	
			2,804 2 11
124 6 9	,, Library, Purchases and Binding of Books	346 17 3	
64 7 5	,, Periodicals and Newspapers ...	... 88 6 9	
			435 4 0
283 10 1	,, Museum Sundries	... 757 19 3	
1,437 15 0	,, Salaries	...1,667 14 0	
734 19 0	,, Wages	...1,523 8 6	
91 11 3	,, Attendants' Clothing... ...	... 138 1 0	
30 0 0	,, Pensions and Gratuities ...	... 35 0 0	
			3,522 2 9
580 0 0	,, Ground Rent	... 580 0 0	
77 9 0	,, Water Rate	... 77 9 0	
678 2 6	,, Rates	... 736 9 2	
181 5 0	,, Taxes	... 217 10 0	
			1,611 8 2
11 13 7	,, Insurance Stamps	... ...	11 12 11
88 14 1	,, Insurance	... ...	62 13 8
13 3	,, Fuel	... 82 10 6	
31 7 7	,, Lighting	... 33 0 4	
			115 10 10
96 13 7	,, Repairs	... 151 3 11	
135 16 0	,, House Expenses and Sundries...	... 246 14 0	
			397 17 11
3 6 6	,, Advertising	... 44 18 0	
2 10 8	,, Shorthand Notes	... 20 5 10	
—	,, Lecture Expenses	... 4 4 0	
			69 7 10
26 5 0	,, Audit and Accountancy ..	... 26 5 0	
			26 5 0
38 6 7	,, Postage of Letters, Stamps, etc.	... 69 10 8	
82 6 1	,, Printing and Stationery ..	... 185 13 2	
10 0 0	,, Telephone	... 10 9 0	
			265 12 10
2,608 7 8	,, Balance—being Surplus Revenue for the year to date, carried to Balance Sheet	...	1,010 8 3
£9,135 7 9			£10,332 7 1

1918. £ s. d.		£ s. d.	£ s. d.
146 18 5	By Sale of Journals	... 124 17 1	
385 14 3	,, Advertisements in Journal ...	... 286 13 3	
			411 10 4
32 15 0	,, Lending Library	...	59 6 6
575 1 9	,, Admissions to Museum ...	...1,056 6 0	
191 19 7	,, Sale of Museum Catalogues and Pamphlets	... 310 18 8	
—	,, Repairing of Regimental Colours	... 17 3 0	
			1,384 7 8
—	,, Hire of War Game Maps ...	... 1 0 0	
4 7 10	,, Miscellaneous Receipts ...	... 8 10 9	
2,231 0 2	,, Rent of Premises, etc. ...	...1,749 16 6	
			1,759 7 3
3,331 13 0	,, Members' Subscriptions ...	...3,505 3 0	
91 14 11	,, Extra Subscriptions	... 91 18 5	
336 15 0	,, Life Subscriptions	...1,064 16 0	
16 15 0	,, Subscriptions paid in advance	... 56 9 0	
			4,718 6 5
888 4 6	,, Dividends and Interest	...	1,089 1 6
750 0 0	,, Government Grant	...	750 0 0
152 8 4	,, Refund of Income Tax on Investments	...	160 7 5
£9,135 7 9			£10,332 7 1

BALANCE SHEET, 31st DECEMBER, 1919.

DR.				CR.			
	£	s.	d.		£	s.	d.
To Excess of Assets over Liabilities as at 31st December, 1918	76,467	12	0	By Outlay on New Building			23,101 16 8
,, *Add* Additions to Museum Contents during the year to date	10,931	19	6	,, Furniture, Museum Cases, etc., as at December 31st, 1918			483 14 6
,, ,, Surplus Revenue for the year to date as per Account annexed	1,010	8	3	,, Library Books, Pictures, Maps, etc., as valued for Insurance			10,222 0 0
	88,410	0	9	,, Museum Contents, as valued for Insurance (excluding Loan Collection £21,666)			33,370 15 0
,, *Less* Amount to write down Investments to Market price as at 31st December, 1919	765	13	10	,, Investments (at Market Price, 31st December, 1919)—			
			87,644 6 11	,, £2,421 18s. 8d. India 3½ p.c. Stock	1,489	9	9
,, Sundry Creditors			1,311 19 3	,, £3,044 17s. 11d. India 3 p.c. Stock	1,613	15	11
,, Museum Purchase Fund			17 9 0	,, £1,471 8s. 6d. Nottingham Corporation 3 p.c. Stock	794	11	5
,, Leasehold Redemption Fund			1,988 6 1	,, £1,181 10s. 0d. Oxford Corporation 3 p.c. Stock	685	5	4
				,, £5,000 Hull and Barnsley Railway Ordinary Stock (Trench Gascoigne Gift)	2,875	0	0
				,, £473 17s. 9d. Canada 3½ p.c. Stock (Hoskier Bequest)	364	17	10
				,, £14,125 16s. 10d. 5 p.c. War Stock (1929-47)	12,925	2	11
							20,748 3 2
				,, Leasehold Redemption Fund Investment Account, at Market Price, December 31st, 1919—			
				,, £1,539 6s. 3d. Ceylon 3 p.c. Stock	1,062	2	6
				,, £1,683 19s. 3d. London County Council 3 p.c. Stock	926	3	7
							1,988 6 1
				,, Sundry Debtors			257 9 11
				,, Cash at Bank	723	0	5
				,, ,, in hand	66	15	6
							789 15 11
	£90,962	1	3				£90,962 1 3

Note.—A sum payable to H.M. Office of Works (estimated at £400) for Painting and Repairs to the Buildings of the Institution, has not been charged against the Revenue Account for the year ended 31st December, 1919, or included among the Sundry Creditors of the Institution in this Balance Sheet.

We have examined the above Balance Sheet with the Books and Vouchers and certify the same to be correct. All our requirements as Auditors have been complied with. We have verified the Cash Balances and Investments set out in the Balance Sheet, and, subject to the Leasehold Redemption Fund being sufficient to provide for the depreciation of the Lease, we are of opinion that the Balance Sheet is properly drawn up and correctly shows the position of the Royal United Service Institution on the 31st December, 1919.

61½, Fore Street, London, E.C.2, 29th January, 1920.

WILDE, FERGUSON DAVIE, AND MILLER, Chartered Accountants, Auditors.

CHESNEY MEMORIAL MEDAL FUND.

DR. 31ST DECEMBER, 1919. CR.

1919.		£ s. d.	1919.		£ s. d.
Jan. 1.	To Balance, 31st December, 1919	56 3 1	April 4.	By Medal—Goldsmith & Silversmith's Co., Ltd. ...	19 10 0
June 6.	„ 6 months Dividend, £230 Bengal and North Western Railway Preference Stock	2 16 4	Dec. 31.	„ Balance in favour of Fund...	44 11 5
July 3.	„ Refund of Income Tax on Investments	2 5 8			
Dec. 3.	„ 6 months Dividend, £230 Bengal and North Western Railway Preference Stock	2 16 4			
		£64 1 5			£64 1 5

We hereby certify the above Account to be correct,

61½, Fore Street, London, E.C. 2.
29th January, 1920.

WILDE, FERGUSON DAVIE, AND MILLER, Chartered Accountants, Auditors.

TRENCH GASCOIGNE PRIZE FUND.

DR. 31ST DECEMBER, 1920. CR.

1918.		£ s. d.	1919.		£ s. d.	£ s. d.
Jan. 1.	To Balance, 31st December, 1918	121 17 7	May 6.	By 1st Prize Essay, 1919	31 10 0	
May 16.	„ 6 mths. Div., £1,862 19s. North Brit. Ry. Deb. Stock	19 11 3		„ 2nd „ „	21 0 0	
June 2.	„ Dividend on £100 5 p.c. War Stock	2 10 0		„ 3rd „ „	10 10 0	
July 3.	„ Refund of Income Tax on Investments	15 13 0				63 0 0
Nov. 11.	„ 6 mths. Div., £1,862 19s. North Brit. Rly. Deb. Stock	19 11 3	Oct. 10.	„ Medal—Goldsmith & Silversmith's Co., Ltd. ...		11 7 6
Dec. 2.	„ Dividend on 5 p.c. War Stock	2 10 0	Dec. 31.	„ Balance in favour of Fund		107 5 7
		£181 13 1				£181 13 1

We hereby certify the above Account to be correct,

61½, Fore Street, London, E.C. 2.
29th January, 1920.

WILDE, FERGUSON DAVIE, AND MILLER, Chartered Accountants, Auditors.

BRACKENBURY MEMORIAL FUND.

DR. 31ST DECEMBER, 1919. CR.

1919.		£ s. d.	1919.		£ s. d.
Jan. 1.	To Balance, 31st December, 1918	51 16 7	Dec. 31.	By Balance in favour of Fund...	72 17 7
June 1.	„ Dividend £421 1s. 0d. 5 p.c. War Stock, 1929-47 ...	10 10 6			
Dec. 2.	„ „ „ „ „ „ „ „	10 10 6			
		£72 17 7			£72 17 7

We hereby certify the above Account to be correct,

61½, Fore Street, London, E.C. 2.
28th January, 1920.

WILDE, FERGUSON DAVIE, AND MILLER, Chartered Accountants, Auditors.

Tabular Analysis of the State of the Institution.

[A full analysis for each year from 1831 will be found in the Report for 1897.]

Year 1st Jan. to 31st Dec.	Annual Subs. received.	Entrance Fees.	Receipts (from all sources).	Life Subs. received.	Invested Funds at Cost.	Invested in the purchase of Books, &c.	No. of Vols. in Library.	No. of Members on the 31st Dec.
	£	£	£	£	£	£		
1831	654	...	654	1,194	...	...	...	1,437
1841	1,450	...	1,643	186	6,000	243	5,850	4,243
1851	1,136	131	1,292	66	666	34	10,150	3,188
1861	2,122	305	2,899	266	2,846	99	11,812	3,689
1871	2,455	237	3,677	538	7,748	202	15,501	3,922
1881	2,893	238	4,967	645	13,670	240	19,920	4,577
1891	2,640	189	5,004	454	21,942	153	23,845	4,204
1892	2,930	605	9,429	1,572	24,805	142	24,099	4,657
1893	2,929	468	8,334	1,095	22,172	157	24,471	4,961
1894	3,598	215	6,625	606	12,840	200	24,680	5,016
1895	3,760	353	7,117	921	8,761	204	25,947	5,198
1896	3,802	351	7,225	876	8,761	245	26,161	5,347
1897	3,910	401	10,902†	959	12,386	381	26,381	5,550
1898	3,964	265	6,935	493	12,386	376	26,592	5,620
1899	3,834	167	6,646	251	12,841	430	27,142	5,583
1900	3,879	174	7,170*	235	13,791	264	27,492	5,491
1901	3,816	197	6,955	358	14,192	289	27,792	5,443
1902	3,806	188	7,063	449	14,491	309	28,167	5,427
1903	3,743	178	6,597	409	15,459	299	28,387	5,361
1904	3,684	184	6,707	448	15,459	301	28,636	5,313
1905	3,713	253	7,756	611	15,459	324	28,851	5,369
1906	3,714	226	6,803	519	16,488	204	29,114	5,404
1907	3,733	211	6,615	573	16,549	256	29,427	5,408
1908	3,741	220	7,205	502	16,612	213	29,667	5,420
1909	3,806	312	7,354	789	16,676	167	29,917	5,535
1910	3,893	269	7,407	573	16,742	326	30,182	5,611
1911	3,988	254	7,319	372	16,810	374	30,624	5,649
1912	4,018	225	7,125	330	16,881	305	31,043	5,654
1913	3,928	159	7,113	266	**12,141	384	31,425	5,580
1914	3,780	101	7,570	98	**12,216	231	31,770	5,338
1915	3,534	46	8,332	77	‡‡14,276	92	31,862	5,000
1916	3,443	13	8,595	344	§13,537	110	32,064	4,980
1917	3,407	—	8,853	446	§§16,414	196	32,425	4,946
1918	3,440	—	9,135	337	‖21,610	124	32,602	4,955
1919	3,654	—	10,332	1,065	¶22,736	347	32,824	

† A donation of stock, valued at £2,323 and £1,301, realized by the letting of seats to view Her Majesty's Diamond Jubilee Procession, are included in this amount.
* This amount includes a donation of £500. ** Value on December 31st, 1913.
‡‡ This includes £2,000 4½ per cent. War Loan.
§ Value on December 30th, 1916. §§ Value on December 31st, 1917.
‖ Value on December 31st, 1918. ¶ Value on December 31st, 1919.

THE CHAIRMAN: Gentlemen, the first resolution of the agenda, which I have much pleasure in proposing, is: "That the Report and Accounts, as circulated, be taken as read and adopted." I expect that you will have all read the Report and Accounts, which I am sure you will agree are very satisfactory. I will ask the Chairman of the Finance Committee to second the resolution, and in doing so to read his Report.

Colonel SIR WILLIAM A. HILL, K.C.B. (Chairman of the Finance Committee): Mr. Chairman and Gentlemen, I have much pleasure in seconding the resolution. When I last had the honour of addressing you I said I hoped that by the next General Meeting we should have returned to our normal position, as regards the management of the Institution, In a large measure we have returned to our normal position, but in many respects we shall never be under the same conditions as in pre-war times. Those will be clear to you when I have made some remarks on the figures presented to you in the Report. I will first take the receipts and expenditure. On the expenditure side the printing of the Journal has increased by £1,026 and the postage by £37, a total increase in the expenses of the Journal of £1,063. The expenditure on the Library—books, papers and periodicals—is more by £246, while the Museum sundries, cases and repairs, are less by £93. Now I come to a very large item. Salaries have increased by £230 and wages by £759, a total increase of £1,019. Here may I mention that, to the very great satisfaction of the Council, these increases have been made without any of those crises, disputes or ultimatums that have been so prominent a feature in many reorganizations of remuneration. (Hear, hear.) Rates and taxes continue to increase, and they are more this year by £94, Insurance is less by £26, as we have no longer to insure against aircraft. We have, however, gone most thoroughly into the matter of insurance, and, in view of the enormous increases in the expense of building and replacements in case of fire, we have very largely increased our premiums. Fuel has increased by £32, as the heating of the Institution, which was formerly done by the Press Bureau, now devolves upon ourselves. Repairs have increased by £55, house expenses by £111, and postage, printing and stationery have increased by £114. So that you will see, Gentlemen, that in all the items, with two exceptions, very large and material increases have taken place. On the other side, the receipts, the sale of the Journal has diminished by £22 and the receipts from advertisements by £99, a total decrease in the receipts from the Journal of £121. The Lending Library receipts, however, have increased by £37. The admissions to the Museum have increased largely, by £481, the entrance fee was raised to one shilling on September 1st, but on Saturday afternoons we only charge sixpence. The sale of the Catalogue at 2/6, a very much increased price, is most satisfactory, there having been an increase of £119 under that head. The rent of the premises is less this year by £1,492. Rent was only paid for a portion of the year and it has ceased altogether now that the Press Bureau have given up their occupation of the building. Members' subscriptions show an increase of £174, and there is an increase in life subscriptions of £728. These increases are no doubt due to the large number of members who have taken advantage of the decreased subscription and the remission of the entrance fee that was in force last year. I may say that the increase in members is continuing and that we have a considerable balance to the good in the first two months of the present year. Dividends have increased by £201, owing to

our investments during the past five years. The total result is that we carry forward £1,010 on the year, a very satisfactory result, especially as we invested a further sum of £2,000 in War Loan.

Turning to the Balance Sheet, you will note a very large sum, £10,931, as an addition to the Museum contents. £10,000 of this is the insurance value of the Wolseley Room and its contents that have been presented to us by Lady Wolseley in memory of Field-Marshal Lord Wolseley. That room is nearing completion and it will very soon be opened to the public. On the other side, the furniture, etc., is taken at far below its value. We have not accounted for any depreciation for some years past, because the furniture is worth many hundreds of pounds above the amount at which it stands in the accounts.

With regard to the investments, which show a constant depreciation, the Council have under consideration a suggestion, subject of course to the expert report and advice, as to the desirability of re-investment of the major part of them. Not counting the War Stock—our recent investments—the total nominal value of the other investments, made mostly many years ago in what at the time seemed very solid and even improving securities, was, £16,812; the present value is £9,208, or a depreciation of £7,604. That is not any fault of ours. Those investments when they were made were considered the very best trustee securities, and no one could possibly foresee the fall in value that has taken place. The present value of all our securities is £22,736. I should like to draw attention to the most excellent work of Mr. Pinhey, our skilful Assistant Secretary, who devoted a great deal of time to the preparation of the accounts, with the results that they were ready, to the great satisfaction of the Auditors, some weeks earlier than in past years. In conclusion, I desire to say that I believe the finances of the Institution are in a thoroughly sound condition and that we may look forward to a period of continued and increasing prosperity. (Cheers.)

Commander W. F. CABORNE, C.B., R.D., R.N.R. (Chairman of the Museum and General Purposes Committee): Sir Doveton Sturdee, My Lords and Gentlemen, It is with a feeling of satisfaction that we hold our Annual Meeting in our own Lecture Theatre once more. Last year, in speaking of the impending release of our premises by the Crown, I said that a considerable amount of time would be consumed in the task of renovation, and so it turned out. The Press Bureau left the place in a state of chaos, and difficulty was experienced by the authorities in supplying the necessary labour. I am not concerned at the moment as to whether labour is fit to govern or whether it is not, but I do know that it rules our destiny when there is any work required to be done. However, our hearty thanks are due to H.M. Office of Works for the manner, both in spirit and letter, in which they have fulfilled their agreement, the Institution buildings being now in absolutely good condition throughout. Coming to the Museum, it has been said that bodies that do not advance really go back. Now our Museum, for many years past, has constantly been going forward, and 1919 has proved no exception to the rule. Those among us who remember the old building in Whitehall Yard, on the site of the present War Office, can fully appreciate the difference that new quarters and some 26 years have made. Few among us in those now far-off days could in imagination have seen the phenomenal

progress that the Institution was destined to make as a great educational centre and as an enquiry bureau, and the general influence it was to acquire in connection with Service matters. The various new exhibits contributed to the Museum during the past year have been duly noted in the Journal, but special attention may be drawn to a few of them. In the first place, there is the Roll of Honour, suspended in the Hall, giving the names of nearly 600 members of the Institution who lost their lives in the recent great war. The work was executed by Culleton's Heraldic Firm from a design by Sir Arthur Leetham. Next is the equestrian portrait of the late Field-Marshal Earl Roberts, painted by Captain Adrian Jones and acquired by purchase, now hanging on the wall of the Theatre. Singularly enough, that is the only object we have connected with that great soldier and illustrious patriot. Then another most interesting picture is that of Charles I (after Vandyke), framed very appropriately in wood taken from the roof of Westminster Hall. This portrait, which hangs in the Banqueting Hall by the window under which the scaffold was erected, is the generous gift of Lieut.-Col. Shoolbred, C.M.G., a member of the Council, the frame being designed by the Curator. A somewhat quaint line engraving of our Saviour on the Cross (of Spanish origin and dated 1790) is now to be found among the Moore relics, it having been in the room at Corunna in which Sir John Moore breathed his last on January 16th, 1809, and it was probably the final object upon which his dying eyes were fixed. The last three exhibits that I will mention are a propeller of Zeppelin L85, the cartridge case of the 12-pounder H.A. gun of H.M.S. "Agamemnon," which brought down the same at Salonica on May 5th, 1916, and the table on which the Armistice with Turkey was signed on board the "Agamemnon" at Mudros on October 30th, 1918. These exhibits have been kindly deposited by our Chairman, Admiral Sir Doveton Sturdee, Commander-in-Chief at the Nore. The visitors to the Museum during the last ten years, excluding many friends of members who did not pass the turnstile, were :—

1910	25,023	1915	53,601
1911	22,848	1916	68,699
1912	23,293	1917	62,706
1913	24,580	1918	67,079
1914	43,174	1919	78,470

The total for the ten years, 469,473, is large, but, considering the historic interest of our priceless exhibits, it should have been at least ten times larger. A new edition of the Museum Catalogue, increased to nearly 400 pages, is now on sale, and in itself forms a valuable addition to the history of the British Navy and Army. It now only remains for me to express the thanks of the Museum Committee to our energetic Secretary and Curator, Lieut.-Col. Sir Arthur Leetham, C.M.G., and also to recognize the good work of our Staff, better men than whom no Institution could wish to have. (Cheers.)

Major-General E. T. DICKSON (Chairman of the JOURNAL Committee) : Mr. Chairman and Gentlemen, I think that all the points of interest regarding the JOURNAL are embodied in the Annual Report. The Chairman of the Finance Committee has already alluded to the increase of expenditure for printing and book-

binding, but I should like to emphasise the point that we have taken great pains to economise funds as far as possible and that I do not think we could have done more in your interests.

The resolution for the adoption of the report and accounts was then put and carried unanimously.

Major A. C. CHAMIER: Mr. Chairman and Gentlemen, I beg to propose: "That the thanks of the meeting be accorded to the Auditors, Messrs. Wilde, Ferguson Davie, and Miller, for their services, and that they be re-elected Auditors for the ensuing year at a fee of 25 guineas." I do not think it is necessary for me to say much in support of this resolution, except that I feel certain that the labours of the Auditors are very much lessened by the excellent way in which the accounts are put before them. I feel sure that if the Auditors were represented here to-day they would say that for themselves. I should also like to say that it may be useful during the coming year for the Council to consult with the Auditors on the question of the depreciation in the securities, which has just been mentioned to us. I propose the resolution with much pleasure.

Major H. G. PARKYN, O.B.E., R.B.: I have much pleasure in seconding the resolution.

The resolution was then put and carried unanimously.

Vacancies on the Council.

The following Officers had been nominated as candidates for the vacancies on the Council:—

Royal Navy (1 Vacancy).

Admiral Sir F. C. D. Sturdee, Bart., K.C.B., K.C.M.G., C.V.O.
Rear Admiral H. W. Richmond, R.N.

Regular Army (4 Vacancies).

Field-Marshal Sir H. H. Wilson, Bart., G.C.B., D.S.O.
Lieut.-General Sir Ivor Maxse, K.C.B., C.V.O., D.S.O.
Lieut-General Sir A. E. Codrington, K.C.V.O., C.B.
Major-General W. H. Anderson, C.B. (Staff College).
Major-General Sir L. C. Jackson, K.B.E., C.B., C.M.G., late R.E.
Major-General Sir V. A. Couper, K.C.B., late R.B.

Special Reserve (1 Vacancy).

Colonel C. H. Colvin, C.B., D.S.O.

Territorial Force (2 Vacancies).

Lieut.-Colonel R. Shoolbred, C.M.G., T.D.
Colonel B. C. Green, C.M.G., T.D. (London Scottish).

Major Chamier and Major Parkyn were appointed scrutineers of the ballot and at a later stage of the proceedings THE CHAIRMAN announced that the following candidates had been elected :—

Royal Navy.

Admiral Sir F. C. D. Sturdee, Bart., K.C.B., K.C.M.G., D.S.O.

Regular Army.

Field-Marshal Sir H. H. Wilson, Bart., G.C.B., D.S.O.
Lieut-General Sir Ivor Maxse, K.C.B., C.V.O., D.S.O.
Lieut.-General Sir A. E. Codrington, K.C.V.O., C.B.
Major-General W. H. Anderson, C.B. (Staff College)

Special Reserve.

Colonel C. H. Colvin, C.B., D.S.O.

Territorial Force.

Lieut.-Colonel R. Shoolbred, C.M.G., T.D.
Colonel B. C. Green, C.M.G., T.D. (London Scottish).

REPORT OF THE REFEREES ON THE MILITARY GOLD MEDAL ESSAY, 1919.

The SECRETARY read the following Report of the Referees—Lieut.-General Sir Herbert S. G. Miles, G.C.B., G.C.M.G., G.B.E., C.V.O., and Major-General E. D. Swinton, C.B., D.S.O.—on the Military Gold Medal Essay, 1919 :—"The subject of the essay was :—'The Application of Recent Developments in Mechanics and other Scientific Knowledge to Preparation and Training for Future War on Land.' We have pleasure in reporting to the Council of the Royal United Service Institution that the essay bearing the motto :—'Race horses don't pull up at the Winning Post' has been placed first ; the writer should be awarded the first Trench-Gascoigne Prize of 30 guineas. The essay bearing the motto 'Celer et Audax' is placed second and the writer should be awarded the second prize of 20 guineas. We further recommend to the Council that the Gold Medal of the Institution for 1919 be bestowed on the writer of the first essay, and that both these essays be published in the JOURNAL. It is regretted that so few essays were submitted."

The envelopes containing the names of the writers of the essays were then opened, and THE SECRETARY announced that the writer of the essay bearing the motto 'Race horses don't pull up at the Winning Post' was Col. J. F. C. Fuller, D.S.O. (Oxfordshire and Buckinghamshire Light Infantry), S.D.4, War Office, Whitehall, and that the writer of the essay bearing the motto 'Celer et Audax' was Lieut.-Colonel W. D. Croft, of the Cameronians.

The CHAIRMAN : Col. Croft is present at the meeting, and I desire to congratulate him most heartily on winning the second prize. (Cheers.)

General A. F. GATLIFF: I have been asked to propose the third resolution, namely, "That the thanks of the Institution be accorded to Lieut.-General Sir H. S. G. Miles, G.C.B., G.C.M.G., G.B.E., C.V.O., and Major-General E. D. Swinton, C.B., D.S.O., for adjudicating on the Prize Essays." The secrets hitherto locked up in the bosoms of General Miles and General Swinton having been disclosed, we now know who have gained the prizes. Gentlemen, as you know, General Miles has had a long and distinguished career and is an officer of the soundest judgment, while most of us have read General Swinton's books with great interest and, I may say, amusement. We could not have had two better Referees, combining sound military judgment and military instinct. General Miles tells me that he has never written a book himself, and, having now had to wade through other people's lucubrations, he will not set about doing so. In former years I once contributed an essay, and I can only say that I sympathize with the officers who have to wade through all the mass of facts, incorrect deductions and altogether unsound conclusions in which the writers of some of these essays indulge. Unhappily perhaps for the Services, very few essays were submitted during the past year, but I congratulate General Miles and General Swinton on having had their labours lessened accordingly. I have very much pleasure in formally proposing the resolution.

Rear-Admiral H. W. RICHMOND, R.N.: I have much pleasure in seconding that.

The CHAIRMAN: Before putting that resolution I should like to say that it is, I believe, an interesting fact that a previous Gold Medal Essay, that written by Captain G. F. Ellison, now the Deputy-Quartermaster General, which won the Gold Medal offered by the Institution in the year 1905, furnished much of the material on which the Terrtiorial Force was formed in 1907. That shows the use of the Institution in encouraging Gold Medal Essays, and we hope the same thing may be said of the Gold Medal Essay of 1919. I am sure we all hope that in the Gold Medal Essay for 1919 much will be found which will be equally serviceable in the way of valuable hints and suggestions to the War Office in framing the new Army.

The resolution was then put and carried unanimously,

Lieut.-General SIR HERBERT S. G. MILES, G.C.B., G.C.M.G., G.B.E., C.V.O.: On behalf of General Swinton, who is not here, and myself, I desire to say that I am very much obliged to you for the kind vote of thanks you have just passed. It was the greatest pleasure to read these essays. Reading essays is very interesting, but it is rather heavy work, especially so after a certain time has elapsed These essays, however, were particularly interesting, because they made a really, serious attempt to grapple with what is going to be the battle of the future. We all have our ideas, and the essayists in this case tried, I believe, successfully and clearly to state the lines on which our preparations should take place. I thoroughly agree with what the Chairman has said, that not only should these essays prove interesting to the many members of the Institution who read the Journal but they will prove fruitful in ideas to those who have the hard task of organizing for us the Army of the future.

The CHAIRMAN: I understand that the Secretary of State for War has asked that a copy of the prize essay shall be sent to him as soon as it is available. I am sure you will agree that that is very satisfactory to the Institution. (Hear, hear.)

General E. T. DICKSON: Mr. Chairman and Gentlemen, I rise to propose the fourth resolution, which reads: "That the thanks of the Institution be accorded to the following retiring Members of the Council:—Admiral Sir F. C. D. Sturdee, Bart., K.C.B., G.C.M.G., C.V.O., Admiral W. F. S. Mann, Vice-Admiral Sir A. C. Leveson, K.C.B., Rear-Admiral H. W. Richmond, R.N., Field-Marshal Sir H. H. Wilson, Bart., G.C.B., D.S.O., Lieut-General H. D. Hutchinson, C.S.I., Lieut.-General Sir A. E. Codrington, K.C.V.O., C.B., Colonel Sir E. W. D. Ward, Bart., G.B.E., K.C.B., K.C.V.O., and Lieut.-Colonel A. St. L. Glynn." I have worked with all these gentlemen during the past year, and I know that they have all had your interests very much at heart.

Commander CARLYON BELLAIRS, M.P., R.N. (ret.): I beg to second the resolution. The proposer made one correction of the resolution as it is set out on the agenda, by substituting "Rear-Admiral Richmond" for "Captain Richmond." That is a very pleasant correction, and I am sure we all desire to congratulate Rear-Admiral Richmond on reaching flag rank. (Cheers.)

The resolution was then put and carried unanimously.

Major-General M. H. SAWARD: Gentlemen, I have been requested to propose the fifth resolution, which is: "That the thanks of the Institution be accorded to the Chairman for presiding at this meeting and for his arduous services during the past year." This proposition requires no words from me to commend it to your attention and approval. All I need say is that those who have had the honour and pleasure to work under the Admiral during his Chairmanship have fully appreciated the care and attention, the courtesy and the able and expeditious manner in which he has carried out his duties, and sincerely regret that he is leaving the Chair. (Cheers.)

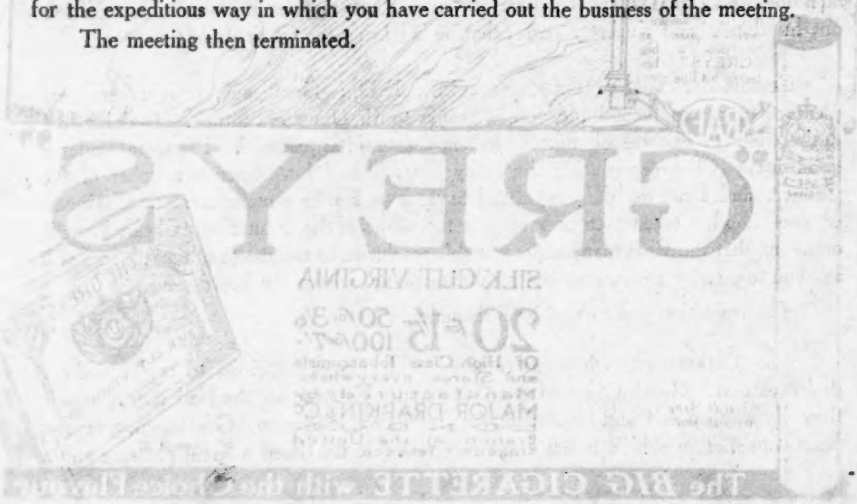
Commander W. F. CABORNE, C.B., R.D.: Gentlemen, It is a very real pleasure to me to second the vote of thanks to Sir Doveton Sturdee. In doing so I desire fully to endorse all that the gallant General has just said. I have sat under a good many Chairmen during the many years that I have been a member of the Council, and I can truthfully say that I have never known a more energetic Chairman or one who has taken greater interest in the affairs of the Institution. (Cheers.) It is apparent that the Chairman cannot put this resolution to the meeting himself, so I will ask you to pass by acclamation the resolution that you have just heard read.

The resolution was carried by acclamation.

The CHAIRMAN, who was received with cheers on rising to reply, said: I desire to thank General Saward and Commander Caborne for the kind way in which they have proposed and seconded the resolution, and you, Gentlemen, for the hearty manner in which it has been received. It has been a great pleasure and a

great honour—more honour than pleasure, perhaps, but certainly an honour—to be the Chairman of the Royal United Service Institution. I notice that my services are described in the resolution as being "arduous." My work has not been arduous at all. I have presided at the few meetings that have been held; we have all been in absolute agreement on the Council, and the most pleasant circumstances have always existed while I have been in the Chair. The Secretary and the Staff do the work and the Chairman takes the honour. I thank you very much for passing the resolution and simply say that it has been a pleasure to serve the Institution. I desire before I sit down to draw attention to the advantages of the Institution. As a young Lieutenant and as a Commander I had the chance of putting my ideas on paper and writing two essays which happened to get prizes. That has been of great benefit to me right through my career, which extends now to some 35 years; I therefore particularly desire to call the attention of all young officers to the advantage of putting their ideas on paper and seeing what is rubbish and what is sound, and gradually forming an opinion. It gives a basis for all subsequent investigation and thought, right through their Service careers. I do not believe that that sort of thing can be started too young. It is a very happy circumstance that last year one Lieutenant got the Gold Medal and another Lieutenant got the second prize, and the former is going in a few weeks' time to give a Lecture to the Institution on "Submarines and Naval Warfare." It shows that the Institution is right up to date, because young officers can express their views and air their opinions here, and get older officers perhaps to say that some of them are not as sound as they should be. That is what we want. We want the young fellows to give us ideas for the older men to consider. That is the use of this Institution, and I am sure it deserves every support from the Admiralty, the War Office and the Air Ministry, which indeed it is getting. It is working in thorough sympathy with those departments, and is I believe serving a useful purpose. It has therefore been a great pleasure to me to have had the honour of being your Chairman for one year. I thank you very much indeed for your kind vote of thanks and also for the expeditious way in which you have carried out the business of the meeting.

The meeting then terminated.



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